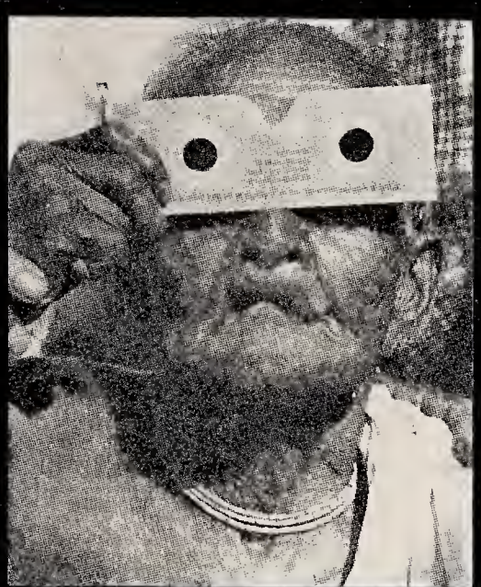

MAN, MYTH AND MEDIA

Ed. by

S. B. CHAKRABARTI

Man, Myth And Media

(an anthropological enquiry into
the recent total solar eclipse
in eastern India)

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Foreword

Man, Myth and Media is the outcome of an on-the-spot recording of human behaviour in response to an one-in-a-lifetime and widely publicized event – the total solar eclipse (TSE). The study was conducted in West Bengal and Bihar.

Man is ever inventive, not only in mobilizing a wide range of information but also in activating latent forces in dealing with situation (s). The very brevity of a TSE was a challenge that demanded mobilization and activation. These roles were completely taken over by the media which is acquiring the dimensions of a social institution.

Studies like these provide us opportunities of immediate correlation between reported and actual practice during events about which people have traditional values, taboos and beliefs. The Anthropological Survey of India in an attempt to test the application of standard anthropological methods to transitory events, started studying the phenomenon of elections. Then there was a catostrophe – the Latur earthquake, which we studied. TSE was one event in which the media took upon itself the responsibility of tackling information, beliefs, knowledge of human beings at various levels.

This study is of interest from the above points of view for another glimpse into human behaviour.

R. K. Bhattacharya
(*Director*)

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Acknowledgements

The present treatise was the outcome of two short reconnoitre by two teams to a suburb very near to Calcutta and a region near Ranchi, Bihar during the occasion of total solar eclipse which occurred on 24-10-95. This rare scene was visible from the locations covered during the short field work. It was possible due to the kind approval of Dr. R. K. Bhattacharya, Director, Anthropological Survey of India, Calcutta. The editor feels obliged to acknowledge this kind jesture of the Director not only for allowing the two teams to undertake such quick survey but also for his active participation with the team of Calcutta.

The participants and the contributors in the project did a marvellous job of completing their papers in spite of various other engagements which made this publication possible. Shri Asit Baran Roy, our colleague, very kindly arranged for the stay of the Calcutta party comfortably in the field. Shri R. N. Kumar of Railway Electrification located at Ranchi arranged for a vehicle for the other team during their journey to distant places beyond Ranchi. Shri Sridam Kundu, Photo-Artist has kindly allowed us to publish the wonderful photograph of the eclipse on the cover of the book which was taken by him.

Shri P. K. Mukherjee of Publication Section took all the pains and personal care for bringing out the present volume very neatly. Finally, M/s. C. K. Printers took up the responsibility of printing the manuscript within a very short time.

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INTRODUCTION

S. B. Chakrabarti

The 24th October, 1995 brought a rare and unique opportunity of watching the Total Solar Eclipse (TSE) in some parts of the country at a variant level of its visibility. This historical phenomenon which came after a lapse of about 400 years were viewed by a large section of population belonging to different socio-economic and ecological background. Prior to the occurence, the scientists and rationalists at large became extraordinarily active along with the media to dispel the age-old superstitions of the people and the consequent cultural compulsion prohibiting them from watching such ominous incident in the stellar body. The scientists, biologists, sociologists, literateures, social and public workers have all contributed their might in bringing a positive change in the minds of the people about this universally sensitive happening of the physical world. From pre-history to modern times one finds a huge accummulation of very important oral tradition and written references in this matter. The scientific advancement of knowledge has fought a perennial battle with the murky imagination of people of all shades and in all countries. The anthropologists as a small community of observers of social facts have hardly traversed the unusually wide field of this nature. They have remained confined bacause of their traditional professional training, to observing human behaviour from a close range on a smaller unit of study. This small unit, whether it is the Eskimo of the polar region or the Munda of a hilly terrain, or whether it is the traditional Chinese or the Babilonian, to cite only a few

example, each one of them has created their own world of cognition related to the wonderful celestial body. The history over time has provided an enduring cultural milieu around these different people, no matter whether they are food gatherers or herders or cultivators or even intellectuals of higher order.

The Anthropological Survey of India could not afford to miss such an important opportunity being available perhaps once in one's life time. At the instance of the Director, almost at the last moment and without adequate intellectual field preparation, two teams were quickly formed to go to the locations where the total solar eclipse fell in the centre line. The idea was to study on the spot spontaneous reactions and response of the people living in a few tribal and non-tribal villages. The first location was identified in a suburb of Calcutta and the other was near Barkakana in Bihar. The Calcutta team was constituted with four scientific officers from the Head Office and the Eastern Regional Centre whereas the Ranchi team was formed with three scientific officers from the Ranchi Field Station and one from Eastern Regional Centre, Calcutta.

The Calcutta team proceeded to Baruipur, the nearest location from Calcutta and finally settled down at the base camp at Kalyanpur. There are a number of villages of different size belonging to Kalyanpur Panchayat Samity. Mainly three hamlets/villages were covered in the evening of 23rd and also in the morning of 24th October, 1995 before and after the total eclipse. Talking to people at Chandipur (the Christian village) and Chakrabera (a Muslim village) was not that difficult because of some initial contact. But another group of the team which observed Dhopagachi (a predominantly Hindu village) had initially a discussion with Mr. D. Bhattacharya, a physicist and an employee at the Saha Institute of Nuclear Physics and another person Mr. A. Chatterjee, a retired personnel from the Voltas and now turned a social worker. Both Mr. Bhattacharya and Mr. Chatterjee gave us a

positive picture on the ground work regarding the spread of information and knowledge about the total solar eclipse in this region. There was no organised monitoring centre set up by the science forum or any other forum. But at individual levels each one of them had organised a number of small group meetings where they propagated the idea of mobilising the people of various sections to encourage to watch the total solar eclipse this time. Mr. Bhattacharya had personally taken interest to bring some tested solar specs for this purpose and he personally took initiative to make some improvised device in this regard. It was also gathered that due to continuous media coverage, Diamond Harbour had emerged as the main centre of observation for this event though literally, Mr. Bhattacharya told, Diamond Harbour location was not actually the centre line whereas Baruipur location was along the centre line. But due to media campaign the people were largely influenced. A number of enthusiastic young men of this area also visited Diamond Harbour. Among the respondents belonging to the Christian population it was revealed that by and large they were free from such superstition as not to watch solar eclipse and to observe taboo for cooking and eating meals. In the Muslim hamlet of Chakrabera it was observed in the morning of 24th October that many of them were watching the total solar eclipse with their own device largely by using X-ray plate and also photo negatives. This time they have not tried to watch it through the collected water in a plate. Among the Christian it was also noted that many of them were engaged in different economic activities including services and some of them also worked in some Middle-East countries. Mr. S. Mandal of Chandipur village, who is a Christian, observed the total eclipse with bare eyes in front of the team without any precautionary measure. He also gave us his address in Bombay so that one could trace him to know whether he was ultimately affected by this daring act. The shops on the way were all open in the morning of 24th. Some of the aged

Muslim respondents told that they would perform Namaj (a ritual prayer) after the duration of total eclipse. It was in fact observed that some of them had entered the mosque for that purpose. One of the respondents also told that they have also partially observed eclipse this time by using some available device.

The village, Chakrabera has about seven to eight hundred households divided into a number of hamlets like Mollarpur, Sonapur, Gazipur, Sunpur, Naskarpur, Khanpara etc. The Muslim people here are mainly cultivators. Some of them also have small business and some trade in fruits. Higher education has not entered into their community in considerable strength but there are a few school final passed and college going students. We had also discussed with S. Mandal a retired supervisor of Texmaco factory. The village, Dhopagachi has also a number of hamlets covering one hundred fifty households. The hamlets are Mandal Para, Naskar Para, Sahapara, Biswas para, Muslim para, Channapara and Daman para. This village is singularly dominated by Puondra-Khsatriya people. It was noticed that they watched the eclipse in large number but the women did not do any cooking. One social worker among them, Shri P. Mondal, categorically confessed that though they have been able to wipe out some misgivings but quite considerably they have not been able to enter into other aspects like cooking and taking food during the eclipse. The Dhopagachi village has four members in the village panchayat of whom one member is an woman. One woman from this village represents the Panchayat Samity. It was gathered that due to the systematic coverage or campaign of the Door Darshan, All India Radio and the newspapers and simultaneous campaign and meetings organised by various science forums, there has been a perceptible encouragement and excitement among the people for watching the total eclipse this time which was far more greater compared to the events of 1980. But it was also a fact that lot of confusion had remained in the minds of people who took

part in the group discussions. This was reported through media, especially the statements that came from the renowned opthalmologists, astronomers and political leaders. The village, Dhopagachi is also basically dominated by the cultivators. There is a primary school and a village panchayat office. The students for higher secondary and college level education have to go to Baruipur and Purandarpur which is a little far from here. This village has not yet produced a physician, but there are one or two engineers and school teachers. In addition to cultivation, trade and business are also reported in this village. Quite interestingly considerable development has taken place in respect of manufacturing surgical instruments in this area since last fifty to sixty years. About 70-80 families exclusively are engaged in this small-scale engineering work. They bring raw material from Calcutta and manufacture the product here. The indigenous village blacksmiths also take some part in these operations.

The locations in Bihar were selected in the district of Ramgarh under South Bihar in Chhotonagpur plateau. Few villages were selected around Barkakana which fell along the centre line for this year's solar eclipse. The populations covered were primarily the Munda, Oraon and Bedia. The Ranchi team had also covered a few non-tribal population groups like Goala, Kurmi, Chamar and Dusadh. It was reported by the team that the people were mostly oriented to traditional beliefs of their own. But the large-scale propagation of the media network also could make some impact of bringing some of them out from that superstitious load to watch the solar eclipse this time.

Although the quick reconnoitre was not thoroughly planned well before undertaking the field survey, but through the intimate observations in selected locations a cross-section of people belonging to various ethnic groups were covered in both the locations. The picture that emerged was quite interesting and instructive of a positive change in the attitude

of the people as compared with various reports on the same event in 1980. The papers in the present volume give a glimpse of that incidental reactions both in the suburb of Calcutta and also in a distant tribal location in Ranchi. And in both the locations this trend of change was visibly marked. The spread of education, both formal and informal, can perhaps alone make a real departure for a positive change not only in scientific attitude to life but also towards the development of collective social awareness.

Solar eclipse : some general observations

S. Chanda

Eclipse in Hindu mythology

Eclipse whether solar or lunar is not a new phenomenon. This has been taking place ever since the earth was created. In ancient times, people had a notion about eclipse which was combination of fear and mystery. Under this situation a number of myth about eclipse had been developed by ancient sages.

In Hindu mythology, solar eclipse is taken into consideration as engulfness of sun by *Rahu* while *'lunar'* eclipse is the engulfness of moon by *Rahu*. According to 'Bishnupuran' *Rahu* is a demon whose father is *Biprachite* and mother is *Singhikar* - the daughter of Ditri. When Bishnu changed himself into a fascinating 'lady' after churning the ocean of milk and distributed *amrita* among the god and goddess, Rahu in disguished form was presented there in order to get the share of the immortal beverage *amrita*. This incident annoyed both the sun and the moon very much and led them to Lord *Bishnu*. They reported the activity of disguished form of *Rahu* to *Bishnu* and requested him to give proper punishment to *Rahu*. Lord Bishnu then cut the head of Rahu with his *Sudarshan Chakra*. Henceforth the upper part of the body of the great demon is known as *Rahu* while the remaining portion of the body is known as *Ketu*. As a result of this punishment both *Rahu* and *Ketu* bacame the great enemies of both the sun and the moon from that day, and whenever Rahu gets a chance he tries to engulf either sun or moon

which is known to us as eclipse. In ancient times this eclipse was taken into consideration as very auspicious. If the eclipse taken place on Sunday it is called *Churamoni Yog* which is treated as glorious one. And if the eclipse taken place on any Sunday in the month of *Paus* (December-January) or *Magh* (January-February) and if it falls on a new moon day then it is called *Ardhadhay Yog*. It is to be noted that eclipse on *Churamoni Yog* occurs frequently than that on *Ardhadhay Yog*. Eclipse on *Ardhadhay Yog* occurs once in one hundred years. The Hindus consider this eclipse on *Ardhadhay Yog* as equivalent to hundred times more auspicious than ordinary solar eclipse. In India the last of this type of eclipse occured in 1935.

Auspicious aspects

The auspicious aspects of the eclipse as considered by the Hindus are as follows :

(1) During the eclipse to take bath in any river is good for health and mind.

(2) Any exchange of gift during eclipse is considered as grand gift.

(3) To take bath during eclipse is much more beneficial than ordinary bath and this bath can avert sin.

(4) To take bath in the river Ganges during the lunar eclipse one acquires one crore *gunas* (qualities) whereas he or she acquires ten crore *gunas* during the solar eclipse.

(5) To take dip in the holy water is to make oblation of water to god.

(6) It is treated as very auspicious to conduct funeral ceremony or obsequial rites at the time of taking bath in holy water during the eclipse.

Restrictions and taboos during eclipse

Since time immemorial, the Hindu sastras imposed certain

restrictions and taboos in performing certain activities during the eclipse as follows :

(1) During the eclipse one should not go to toilet which might cause serious diseases.

(2) One should not undertake any journey including foreign tour.

(3) Married woman should not pay visit to in-law's house for at least 7 days.

(4) One should not cook or take any food during the eclipse which might cause bacterial infection.

Islamic version on eclipse

In course of the development of Muslim religion Prophet Mohammad also gave an idea on eclipse to his followers.

Among the Muslims, during the solar eclipse special prayer *Namaz-e-Kasoof* is held in the morning at the *darga*. The purpose of these special prayer is to keep away all unforeseen calamities that may follow through the eclipse. A solar eclipse symbolises the anger of Allah. He is the supreme creator of the universe who has the capability to take away the life given by the light of the sun. By doing this, He warns his followers and the whole of the humanity to follow the path of rightousness and piety. It is said that since the inception of Islam, Allah through Prophet Mohammad, asked human kind to follow His precepts and not to worship His creatures. Allah is the creator of everything - the sun, moon, stars etc.

Through the solar eclipse, He expresses His anger against those who worship creations which are unable to help themselves. The special prayer which is performed on the day is to appease *Allah* and to inform others that only Allah can rescue mankind from calamities. In the *Quran* it has been noted that only Allah has the power to make an eclipse. During lunar eclipse Prophet Mohammad used to conduct special prayer at night. During the eclipse, no restriction of taking food or movements have been prescribed under

Muslim religion. The Muslim do not have any custom to take bath or to dip in sacred water during the eclipse.

Scientific explanation of eclipse

In course of time and with the advancement of science and technology, scientists tried to give us a scientific idea about solar and lunar eclipses.

Eclipse normally means the hiding of one heavenly body behind another. The eclipsed object, the eclipsing object and the observer are in a straight line.

Solar eclipse : In a solar eclipse, the moon appears to pass across the sun so that the moon's shadow sweeps over the earth's surface. If the moon appears to cover the sun completely there is a total eclipse of the sun. The observer is in the umbra of moon's shadow. If the moon only partly covers the sun, there is a partial eclipse - the observer is in the penumbra of the shadow. The moon's shadow is narrow so that total eclipse of the sun is rare at only one place on the earth. It is an coincidence that sun and moon appears to be of similar size from earth. However, as neither the earth-moon distance nor the sun-earth is constant, the size of the sun and moon seen from earth do vary considerably. Sometimes there is an annular eclipse when the moon is not 'big' to cover the sun's disc. Then the vertex of the lunar umbra does not reach the earth surface.

As the earth's shadow is larger than the moon's, lunar eclipse are more commonly seen than solar eclipse. Lunar eclipse can occur only at full moon, when the earth's shadow sweeps the moon's surface. They also last longer than solar eclipse, as earth and moon are now moving in the same direction through space.

Another big difference is that the lunar eclipse does not clearly show umbra and penumbra. This is because sunlight is refracted into the umbra cone by the earth's atmosphere, acting às a 'Ring shaped' lens. This refraction also explains

the reddish colour of the moon during eclipse. Eclipse does not take place every month because the moon's orbit is inclined at an angle of about 5(degree) to the earth's orbit.

What's in view during solar eclipse

During solar eclipse one can view the following objects :

Corona - the sun's spray of gas which the sun blows out into space, the corona forms a feathery, pale cloud that surrounds the sun and extends millions of miles out. Temperature rises about a million degrees. This was first discovered and noticed in Europe in 1868 and in India in 1942.

Shadow bands – Wavy lines seen rapidly moving across the ground just seconds before and after a total solar eclipse. An atmospheric phenomenon shadow bands appear as ripples of dark and white bands on any smooth surface. This was first discovered by Astronomer Goldsmiths in 1820.

Bailey's beads – Bailey's beads are caused by the shining of the Sun's rays through the valleys of the moon's irregular profile. These can be seen immediately before and after a total solar eclipse. It was first noticed by Sir Edmond Haliey but finally explained by astronomer Francis Bailey in 1836.

Diamond ring – A luminous ring, the glitter of which is enhanced by the darkness that engulfs the sun during eclipse. The bright spicks is the diamond, the inner corona.

Contact points – These are the points where the disc of the sun and moon seem to meet and part as seen from the earth. A total solar eclipse shows four distinct contact points.

Some important points on eclipse

In order to have a clear idea about eclipse, scientists have put forward some points as follows :

(1) Every year there will be at least two eclipses. Maximum number of eclipse can take place upto seven. In 1935 seven eclipses took place of which five were solar and

rest were lunar.

(2) Every five year alternately there are two solar eclipses take place but no lunar eclipse.

(3) Every year there is at least one solar and one lunar eclipse.

(4) Maximum time of duration of total solar eclipse has been recorded upto 7.5 minutes in the equatorial belt while in other places the duration of time is very short. Maximum period of duration of partial solar eclipse so far recorded is 4.5 hours.

(5) Maximum time of duration of lunar eclipse as has been reported was 4 hours while in normal case the duration is only one hour and 50 minutes.

(6) At a given moment solar eclipse can be seen in small area but lunar eclipse can be seen in vast area.

(7) In northern hemisphere, solar eclipse starts from right side of the sun while in southern hemisphere, it takes place from the left side of the sun.

(8) In northern hemisphere, lunar eclipse starts from left side of the moon while in southern hemisphere it takes place from right side of the moon.

(9) During lunar eclipse on earth, solar eclipse takes place at moon.

(10) From moon itself, one can see eclipse on earth during solar eclipse.

(11) Solar eclipse takes place only on new moon while lunar eclipse takes place only on full moon day.

Solar eclipse in 1980

On February 16, 1980 in a cosmic game of hide and seek the sun hide behind the moon, rolling a wave of darkness 112000 km. across Africa, India and China. One half of the

world's four billion people were in the moon's shadow. The sun's rays were completely blocked for upto four minutes in 150 km. wide path of the total solar eclipse and less spectacular effects were seen over a vast areas. In peninsular India the effect was visible.

Life came to a halt in towns and cities of the country. Reports from various centres say that there was more panic and fear than excitement and thrill normally expected for a celestial event taking place after eightytwo years. So, scared were the people that they decided to stay indoors rather than taking the risks by looking at the eclipse partial or total through filters and protective divices.

Total solar eclipse in 1995

After a lapse of 15 years 8 months 8 days we have experienced a different picture on the total solar eclipse on October 24, 1995. The total solar eclipse touched initially in the desert area of Rajasthan in between 28.05 'N and latitude and 74.79 'E longitude. The central line of totality which touched India after having traversed Iran, Afghanisthan, Pakistan and crossed India, Bangladesh, Myanmar, Thailand, South China, North Borneo, Celebes Sea and the Pacific Ocean before ending its sweep on the surface of the earth. In India, it moved slowly towards S. E. direction, crossed north of Madhya Pradesh, south of Uttar Pradesh, south Bihar, Gangetic belt of West Bengal including Sundarban area of West Bengal in between 22.12 'N latitude and 88.42 'E longitude.

Since 1914, India had experienced of four total solar eclipses e.g. August 21, 1914; June 30, 1954; February 16, 1980 and October 24, 1995. The next will be on August 11, 1999.

In the gangetic valley of West Bengal, the first total solar eclipse was observed on May 10, 1575, then October 24, 1895 and next will be after 399 years.

This time the total solar eclipse was viewed from as many as 17 towns in West Bengal.

Total solar eclipse : a short note on a field visit

Kumkum Bhattacharya

October 24, 1995 was the day for TSE (total solar eclipse), a phenomenon that is so rare that it is repeated in a particular place every 400 odd years. A team of four anthropologists and three 'in-training (temporary)' enquiring people left Calcutta for Kalyanpur and Baruipur on October 23, 1995, early in the afternoon. Both the above-mentioned places were in the direct line from Rajasthan to West Bengal where the eclipse would be visible and after Diamond Harbour (West Bengal), these places would experience the second longest duration of the TSE. These places were chosen for two reasons - one, it would not be overcrowded by outsiders nor is it urbanized to attract tourists. The other reason was the available accommodation for the team at such premium time. The object of the field visit was to study on-the-spot behaviour of the people before and during the TSE, to see whether there is consistency between reporting and actual behaviour on the part of the population under survey. It was planned to cover individuals of a wide range of economic and religious background.

On reaching Kalyanpur, the base camp, the team was divided into two, one half went to villages around Kalyanpur and the other went towards Baruipur which has a science club.

The author was in the first team. We went first to a big Hindu village and keeping the hierarchical lines of caste, we visited a Brahmin household. Overbearing hospitality - chairs to sit on, fans over our heads, a room stuffed with all kinds of

furniture and things, and best of all we met one patriarchal lady who dominated over all our deliberations. She caught our attention right at the start of our meeting and held on to it till the end. She explained to us that she would not see the TSE not so much because it was tabooed but because it really harmed the eyes. She recounted how a young relative of hers had to be treated for near blindness after watching a similar eclipse. She also added that the scriptures do not permit widows to watch. This was a new kind of information as we were expecting to hear other things that by and large people believe, like eclipse spoiling food and water, or to avoid eating and drinking during the eclipse. Pregnant women are also not supposed to view any kind of eclipse. The old woman had made up her mind not to watch the eclipse, however rare it may be, because she remembers other sightings in her lifetime. There were enough children and young people in the house who planned to see the TSE, most of them had procured old X-ray plates folded into layers to protect the eyes. From this formidable presence we visited a Vaishnava household, made up of two young brothers and their wives. The elder brother is a Kirtaniya, their livelihood is agriculture. They did not show much eagerness about the TSE, they were aware that it should be seen through X-ray plates or film negatives. They planned to eat a little earlier than usual to finish eating before the eclipse sets in. That the eclipse would last for at best a few seconds did not seem to alter their plans. It seems the effect of the eclipse lasts longer than its actual duration. The elder brother explained to us that Vaishnava teaching warned against sighting of eclipse, that there must have been knowledge, may be ancient, about its bad effects on the eyes.

From this we went to a low caste household in which we found an old woman cooking the evening meal. She responded to our question whether she would see the eclipse, with an emphatic 'no', adding that she would hardly have the time. She too expounded on the bad effects of the eclipse

on food, water as well as on pregnant women, eyes, etc. Her grandson walked in while we were there clutching film negatives, at least we gathered that here was one person who was making all arrangements to see the eclipse. The old woman was quite loquacious and in a torrent of words tried to explain to us the mysteries of nature and its supernatural character. She planned to cook food and fetch water only after the eclipse was over. She bemoaned over the younger generation's lack of knowledge and getting swayed by whims.

From this village we went to a Muslim village where we were told that Islam too forbids them from seeing eclipses. They said that the Imam of their mosque, though away but expected early next morning, plans to hold a special prayer meeting in the mosque to recite particular portions of the *Kalma*, appropriate to eclipses. There was an attempt to relate concept of *gunah* and eclipse but because of the absence of the Imam or wise persons, they felt that they were not being explicit enough to satisfy us. They did not seem to attach much importance to food, water and eclipse. We came back to our base camp, late in the evening to find that our hosts had created a miracle - a hot chicken meal. At least, our hostess did not have reservations in cooking small amounts which we found in most households that we surveyed as they would have had to throw it out if not consumed. The other team returned from Baruipur where they encountered more organized arrangements for sighting the TSE.

24/10/95 D-dayhad arrived. We quickly stuffed ourselves with some breakfast and set out. The plan was to make a tour of the Muslim village (because it was on the way), Baruipur and then leave for Calcutta. As we reached the village the TSE was beginning (some of the team members may have a recording of the time), people of all ages except women had gathered to see it. The prayer service was forgotten as people stood transfixed at the sight of the moon eating up the sun from the lower right hand corner. The diamond ring, the

brightest that ever will be seen or has been seen, the round line of light at the edges and then a hush as darkness descended, the water in the pond became black, the ducks left the water to walk around the sides and a cool breeze started blowing. The quality of light was soft yet everything was in focus, trees appeared shimmering in the half shadow half light - but only for seconds when all normalcy returned. Eating up was faster than the shadow leaving the sun. Everybody used some kind of filter to see the eclipse. The special prayer meeting, it seemed would be held only after the eclipse. We did not stay to see this as we were keen to visit other households in the neighbourhood. On the way to Baruipur we came across more or less big concrete houses having Goanese names on the gates - D'Silva, D'Costa, D'Rozario, etc. We came across two churches in the vicinity. We boldly entered one house of the D'Costas and discovered a very well-to-do family. Mr. D'Costa has been all over the globe; he has been with the merchant navy for many years. His well furnished part modern, part rustic house was fascinating and even more fascinating was his life history. They are Catholics of Portugese origin having one daughter who has been married to a compatriot who is also in the merchant navy moving round in the Middle-East, and one son studying in St. Lawrence, a reputable school in Calcutta, staying in the hostel. They were not interested in seeing the eclipse but we persuaded them to see it through the special glasses that we had. There was a lot of excitement in everyone as each saw the waning of the eclipse. Mrs. D'Costa reported that the local *padri* had warned them against seeing the eclipse as it was not right to see god's gift of light being hidden. However, this family did not express any scruples regarding throwing away of food during or after the eclipse, she made tea for us. We left their hospitality and strolled around the place to see whole families out on the streets trying to catch the last glimpses of the eclipse. There was one youth who in a dare devil manner saw the eclipse without using any

protection. We met people who came from diverse occupations, there was one who sells *nasta* in Bombay, there was another who works with jewellers in Gujarat, visiting home for the Durga puja. Some of the families we met on the streets were Christians (Catholics) and some Hindus.

From there we went to Baruipur town to the local youth club where a rousing welcome awaited us. They told us of countless people with video cameras, movie cameras, television units, etc. that had come from Calcutta to film the eclipse. They reported that to their knowledge everybody, including women of various ages had seen the eclipse and that everyone had used filters. They lauded the sustained mass awareness campaign that was initiated by all mass media agencies to train people about the do's and dont's in this regard. They spoke highly of the T.V. coverage of the entire range of the places from where TSE was visible in India. This was a group exposed and familiar to popular mass media, economically closer to Calcutta and its way of life and up-to-date on information. They said that they believed that taboos against seeing the eclipse or throwing away food, etc. were mere superstition without any harm, though. The local science club had made arrangements to supply pairs of specially made cardboard spectacles certified by the ISRO (Indian Space Research Organization) letting people know the exact time of the eclipse, etc.

Like all things, good or bad come to an end,. TSE and its excitement came to an end and we made our way back to Calcutta and its grime and soot. The anthropologists were overjoyed to be in the field once again, talking to people, probing into their mind sets, walking into homes with only their intentions of gathering information as their bonafide. The pretenders had a wonderful and instructive time learning how easy it is to approach people and break the ice and that people were hospitable, unsuspicious of strangers and willing

to share their beliefs and notions.

It can be said in conclusion that there was a lot of mass awareness about the TSE, people could watch it both live and on T.V., there was more or less consistency in what people said and did. Control of superstition on behaviour regarding eclipses is reduced, at least apparently so. It seems that the traditional ideas regarding eclipses posed no challenge to the media and its coverage of the TSE.

Beliefs on total solar eclipse : tradition die hard

Jayanta Sarkar

Eclipse, be it a partial or a total, be it a solar or a lunar, always creates some impact on the normal activities of the Hindus of India. Such an event, when occurs, draws their attention, primarily because of its association with certain superstitions and beliefs as well.

Occurance of a total eclipse, particularly when it gets wider publicity through print and electronic media due to rare vision of diamond ring around the sun naturally is expected to invite attention of all walks of life, irrespective of their socio-economic background.

Such a rare occasion of total solar eclipse, depicting diamond ring, was visible in many parts of India on the 24th of October, 1995. In the eastern part of India this was viewed from the Gangetic belt of West Bengal in between 22.12′ N latitude and 88.42′ E longitude. People of some areas of South 24 Parganas like Diamond Harbour, Baruipur, Kalyanpur got the chance to have a view of such a rare event.

As an anthropologist I took the opportunity to examine if the people viewing total eclipse had shrug off the superstitious beliefs under the influence of various kinds of educative propaganda spearheaded by the electronic media like the Television, All India Radio, and print media like the newspapers, magazines, etc., and also due to activities of some forums involved in educating the people about the scientific reason of such happening.

An overview of the reaction of the people of this particular geographical area, to this rare event was gathered by my other team members through a large number of interviews.

In this paper I shall make an attempt to place my conversation that I had with members of a single family, which to my understanding, would give a transparent picture of mind of middle-class Hindus of this region.

On the evening of the 23rd October, 1995, the day before the total solar eclipse occured, like my other team members I was also enquiring from people 'what they did when the last total solar eclipse occured' in the year 1980 and what they would do on the 24th October ? 'How they plan to view the eclipse?' The replies that I received were similar to those which other team members gathered.

In course of my such at random interviews I happened to enter in a family that consists of five members, namely a man of 56 years, his wife of 48 years age, their son, aged 30 years and son's 25 years old wife and a grand son of eight months old.

The head of the family Shri R. Mandal passed Higher Secondary examination from West Bengal Board of Secondary Education and has been working in a Block Development Office at Bishnupur (2). He is in government service since 1965. He commutes daily to his office from Dhobagachi in morning and returns to home in the evening. Smt M. Mandal, wife of the head of the family studied upto Class V in a school at her natal village. She got married at the age of 15 years. She usually remains at home and attends to all the domestic chores through out the day. Shri D. Mandal, the only son of the family is a Science Graduate from the University of Calcutta. He is a central government employee and has been working in Telephone Exchange Office at Calcutta. He also commutes daily to Calcutta for attending the office and returns back to home in the evening. Ms. C. Mandal, wife of Shri D. Mandal is an Arts graduate of the University of Calcutta. She

got married at the age of 23 years. She hails from a middle class Hindu family from a nearby village. She assists her mother-in-law in her domestic works. The fifth member is Shri A. Mandal, eight months old son of Shri D. Mandal.

I had approached this family in the evening of the 23rd October and informed them that I came from Calcutta to do a very quick survey to generate information on the nature of reactions of the people of this area on the total solar eclipse.

All the four adult members of the family stood around me. The conversation that I had were as follows.

I put my questions first to Shri R. Mondal, "Probably you know that tomorrow a total solar eclipse would be visible from this place". His reply was that he knows about it. He also said that all of them had been listening about this event in the T.V., reading about it in the news papers, listening from other on his way to office and also in other places. When I asked him whether he would view the eclipse, his reply was in affirmative. `How he propose to view it' was my next query. He informed that his son had brought an exposed X-ray plate which would be used to see the eclipse. I enquired whether he had ever used such X-ray plate earlier in 1980 ? His reply was in negative. In 1980 he had viewed the eclipse through dark sun glass. He also informed that many of the people of this locality did not see the total eclipse in 1980 as they were given to understand that viewing total eclipse would be harmful for the eyes and also it might have some bad effects on the human body. Therefore most of the people preferred to remain indoor. `What is the overall situation this time' ? I asked him. He replied that the news papers and T.V. had been constantly reporting that if the total eclipse was viewed through specially made spectacles/exposed X-ray plates, bad effect on the eyes could be avoided. The media also reported that such an event was extremely rare and may be visible once in a life time.

I then enquired from him if he had ever seen a partial solar

eclipse. In his reply he stated that he had viewed eclipse several times. When I asked him if he had any fear of any bad effect from such a view of partial eclipse, his reply was very clear. In fact in past he had viewed partial solar eclipse through a glass coated with smoke. Sometimes he also observed such an event through water kept in a plate. Even he viewed partial eclipse in bare eyes.

I then tried to get some information on some of the beliefs and asked him whether he has any inhibition to take any kind of food during the total eclipse scheduled to occur next day. With little hesitation he replied that he did not have any inhibition. But nothing would be cooked in the house at the time of eclipse. I further enquired whether he had ever taken any food in any of the eclipses occured earlier. His reply was 'no'.

I then asked Smt. M. Mondal whether she would like to see the total eclipse next day. Reply was not very clear like her husband. She said that her son was asking to see the total eclipse as it was a very rare and at the sametime memorable occasion. I then wanted to know if she believed that viewing a total eclipse might have some evil effect. She replied that this time people were telling that there was nothing to fear. She added that she would take a bath in the holy Ganges, if she viewed the eclipse on the 24th instant. "Why should she take a bath" ? I enquired from her. She said that she had learnt from her parents that such a bath would help removing all bad effects of `*Rahu*' (demon) who engulfs sun or moon during an eclipse.

On this point I tried to know whether she still believed in *Rahu*'s engulfing of a sun or the moon ? She did not have any reply to my query, instead kept mum indicating acceptance of such belief.

I was offered a cup of tea and snacks during the interview. I asked the lady whether she would offer me such hospitality, if I would have come next day during the eclipse. The lady

smiled. The other family members also joined her. She said that normally she would avoid cooking during the eclipse. Moreover if there are any food item the same would be kept with basil leaf which, it is believed would protect the food from evil's eyes. She would not mind to offer me such items, but none of her family members would be served with tea or snacks to give me company. It would, however, be difficult for her to prepare tea during the eclipse. I could understand her mind. To be more confirmed I asked what she would do with the stock of drinking water in the house ? Would she throw away all the stock of drinking water ? The reply was yes. None of the family members would drink water during the eclipse. I then further probed whether she would resist other members of her family consuming any food items or drinking water ? They would not take, she replied with authority. It is not the custom of the Hindus, she added. On being asked, her son informed that like others he would also see the eclipse through an exposed X-ray plate which he had already collected.

When I enquired whether he would take any food or drink he did not give any specific reply. Instead, he said that he had no inhibition in taking food or drink during the eclipse but in reality he had never taken any such item in past on such occasion. He did not wish to be involved in any such activities that would hurt the belief and sentiment of family members, specially his mother.

Lastly, I put a similar question to Smt. C. Mondal, daughter-in-law of Shri R. Mondal. When I asked her if she knew the scientific background of eclipse. Her reply was in affirmative. She had some idea about the astronomical position of the sun, moon and the earth, though not very clear. None the less she knew it as a natural phenomenon.

I put a question to know why should then she stay away from taking any food items or should refrain from cooking or perform such other activities. According to the lady, prior to

her marriage she observed her mother, grand mother advising the family members not to be involved in certain activities which were believed are closely associated with the Hindu society. After marriage she saw her mother-in-law to follow the same custom. According to her these were not superstition but were the part of the tradition. She finally said when there was no harm in following such age-old beliefs and traditions, why should she indulge in violating the custom and risk the well-being of the family members. Who know such activities might bring some adverse effect and misfortune to her child and other family memebrs.

The interview of the four family members provided me with a clear picture how the beliefs associated with the occurence of total solar eclipse exert impact on the behavioural pattern of members at the family level. An overall impression that I could gather through a number of interviews of different people on the day of actual occurrence of the eclipse, by and large conform with the beliefs expressed earlier by the four members of a family.

I observed the actual reaction of the people of different age and sex groups belonging to different castes and religious groups on October, 24.

It took the shape of a festive occasion. A large number of villagers came out of their houses to view the total eclipse through the improvised transperancy made in most of the cases out of exposed X-ray plates. A few also used dark sun-glasses.

I could notice the enthusiasm among the young boys and girls. The members of middle aged women were less, in comparison to the men of this age group. However, absence of old aged persons of both the sexes among the viewers could easily be noticed. It could also be seen that the road-side tea stalls and snack bars were closed. Overall accounts on the behavioural patterns of a cross-section of the villagers

of the area are available in the reports of the team members (Bhattacharya, Chakrabarti, Chanda, 1997).

On our way back when we reached Baruipur, eclipse was over. We made a brief halt at the market area. The road-side snack bars, tea stalls which had opened immediately after the eclipse was over, faced maximum difficulties to handle the rush of customers. When I asked a snack-bar owner why he did not keep the shop open during the eclipse, his reply was very simple, but had a bearing on the general beliefs of the people. He said that no customer would have come to buy any eatable during the eclipse as it was against the tradition. This was in conformity with the views expressed by the villagers.

The interviews that I had recorded from the four adult members of a Hindu family clearly suggest that even though the two educated male members were well aware about the scientific explanations of eclipse, they preferred to honour the wishes of the female members of the family and accepted the restriction put by them as 'tradition' and not superstition. The young, educated knowledgeable lady of the family refrained herself from getting involved from those activities which one was not supposed to perform during the eclipse as she had learnt in her natal family.

The beliefs she carried to her husband's family. She continued to follow such restrictions accepting these as 'cultural tradition' of the Hindu society.

It is discernible from the foregoing observations that the beliefs, be these superstition or otherwise, get deeply rooted particularly among the females, who help persistence of traditions.

Solar eclipse : cognition and myth in tribal universe

Gautam Kumar Bera

The present paper aims to highlight the cognitive dimension of solar eclipse among some tribes of Chotanagpur plateau, Bihar and also tries to signify the mythical contexts present in their cosmology to elucidate the relationship between celestial objects and human being. Side by side an attempt has also been made to look into the life and culture of the non tribal groups living in this area to decipher the same dimension. When subjected to structural analysis, myth has been used here as a key to understand the information about the way human beings conceived of themselves and the ultimate meaning of their cosmology. There have been cultural differences in the perceived structure of the universe which have been correlated with differences in ideas of time, of historical consciousness or the lack of it, and in ideas of the self. In this way, through a succession of imagined confrontation with different cosmological assumptions, different societies took on a more definite and specific form as it were, affirming and strengthening its own identity in relation to others.

While analysing the cognitive aspects of tribal myths pertaining to their cosmology, one comes across certain ethnographic issues which need to be highlighted before going into the details. The data were collected from six villages of Chotanagpur plateau in Bihar which comprised the tribal populations of Munda, Oraon, Karmali and Bedia. The non tribal people comprised the communities like Gwala, Kurmi,

Chamar, Dusadh and Julaha, all professing Hinduism except the Julaha who subscribe to Islam. In a different field situation work was also done among the Asur living in the villages of Ramjharia, Jobhipat and Sakhuapani of Netarhat plateau.

The locale of the study comprised the villages, located in the periphery of Barkakana, namely CIC Linepar Basti (3 kms.), Pahanbera (5 kms.), Urloong (6 kms.), Chotkakana (1 km.), Kataliabera (3 kms.) and Kairabihar (6 kms). Of these, Pahanbera, Urloong and Kairabihar are uniethnic villages inhabited by the Munda, Oraon and the Bedia respectively. Barkakana is situated within 23°38′ North latitude and 85°34′ East longitude in the district of Ramgarh in Bihar. It has a Sub-Divisional Railway office running under one Additional Divisional Railway Manager and the Railway Station comes under the Eastern Railway zone of the Indian Railways. The place is approachable on railway track from Howrah Station (Eastern Railway) covering a distance of 412 kms. and on road one can reach Barkakana covering a distance of 59 kms. on National Highway no. 6 from Ranchi town. Barkakana, as a place, got its prominence in the year 1926 when the railway track was installed. Till 1958 the Station was manned by British Officers. In 1958, Mr. A. K. Mukherjee took over the charge as Assistant Operating Superintendent as the first Indian Railway Officer of Barkakana. The Station is mainly meant for military dealings and loading of coal which is accumulated from nearby mines. The station is flanked by two villages, one big and the other small, named Barkakana and Chotkakana respectively. A local belief is present among the inhabitants here regarding the etymology of the villages. It is believed that, in the past the area was inhabited by two Oraon brothers who were *Kana* (one eye blind). The elder brother owned more quantum of land and the younger brother owned less quantum of land. The respective areas where they inhabited have been named after them as Barkakana and Chotkakana villages.

As per the information circulated by the National Council

For Science And Technology the Solar Eclipse was visualized in India on the 24th day of October 1995 at certain places which came under the totality zone. The information also released that the Solar Eclipse started from Teheran, the capital town of Iran in the middle-east, at 7.22 hours IST where the duration of the Total Solar Eclipse (TSE) was about 25 seconds with a spread of 19 kms. of the shadow of the moon. After 07 minutes of this, the shadow of the umbral-cone of the moon started travelling in south-eastern direction towards Afghanistan and Pakistan to touch the Indian territory. It then entered Alwar (7:24:04 to 9:51:07 IST) and Bharatpur (7:24:48 to 9:53:21 IST) in Rajasthan, Fatehpur Sikri (7:24:09 to 9:53:07 IST) in Uttar Pradesh, Bhind (7:25:21 to 9:55:50 IST) in Madhya Pradesh, Hamirpur (7:26:02 to 9:58:33 IST) and Allahabad (7:27:03 to 10:02:08 IST) in Uttar Pradesh again, Daltonganj (7:28:32 to 10:07:19 IST), Ramgarh-Barkakana (7:29:07 to 10:10:08 IST) and Ranchi (7:29:34 to 10:10:34 IST) in Bihar, and Purulia (7:30:04 to 10:12:09 IST) and Ghatal (7:31:37 to 10:16:19 IST) in West Bengal to finally vanish from India at Diamond Harbour) 7:32:01 to 10:17:08 IST) in West Bengal. Hence, in India, the totality zone fell in parts of the states of Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar and West Bengal. Incidentally the shadow of the moon, in this eclipse, covered about 14000 kms. on the earth's crust finally vanishing in the galaxy from the Pacific Ocean at 12:43 hours IST on the said date. Barkakana happens to be the place where the centre line of the totality zone passed through and the duration of the ecilpse was for about two hours and fourty minutes with a phase of Total Solar Eclipse (TSE) for 74 seconds.

Coming to the core issue of the concept of Solar Eclipse in tribal cosmology one finds the story of debt of rice among the Oraon and the Munda who are considered to be numerically dominant tribes of Chotanagpur plateau. According to the legend the moon once borrowed some rice from the sun. Then unable to pay the debt, the embarrassed

satellite hid behind the sun in remorse, blocking it and causing the Solar Eclipse. The Karmali, another tribal group of the region, also subscribe to the same legend. Partially similar to this legend, another legend has been noted from a different field situation in the far western end of Chotanagpur plateau. The Asur, who are traditional iron ore smelters of Netarhat plateau, narrate that they have two important gods named *Singbonga* (Sun god) and *Nidabonga* (Moon god). It is believed that during Solar Eclipse *Singbonga* is swallowed by *Nidabonga* in anger. The Bedia, another tribal group of the plateau, could not cite any such legend regarding the eclipse. However, it is learnt from them that the earth continually moves and at a certain point of time it gains such a momentum that the sun and the moon are not visible by human being. If it is day time, it is called Solar Eclipse and if it is night time, it is called Lunar Eclipse. When enquired of the movement of the earth, they justify that there is strong reason to believe that the earth moves. It is so because, while moving continuously, it sometimes hits the hard crust of big hills and the earth starts quaking which is felt as earthquake.

The non tribal Hindu inhabitants, specially the Gwala, Kurmi, Chamar and the Dusadh have a different story to narrate. According to their belief, once in the past, the sun borrowed some rice grain from the Dom king with the promise to return the same after a specific time. But he could never repay the debt. Hence, the Dom king, in disguise, comes periodically to ask for the rice grain. The sun, being helpless, hides behind the moon to escape from the Dom king of the earth. It then becomes impossible to view the sun from the earth. Hence, Solar Eclipse results. The Julaha, who profess Islam, do not subscribe to any such legend but they attest the occurance of Solar Eclipse as a supernatural phenomenon of the almighty.

However, whatever may be the belief in different societies, it is remarkable to note that the prescriptive and the proscriptive norms of work during the eclipse is almost similar. All the

ethnic groups, under discussion here, put some rice grain in a *sup* (winnowing fan) or a *tokni* (leaf basket) and a coin and keep the same on the thatched roof of the house before eclipse starts. The tribals do this ritual in a manner which is little different from the non tribals. In tribal families only the head of the family puts the rice grain whereas among the non tribals, all members individually put rice grains in the same container for its onward transmission to the roof. After the eclipse is over, the house is smeared with cowdung paste by all communities irrespective of their ethnic affiliation and they take bath with a belief to ward off pollution caused by Solar Eclipse. However, the Asur do not take bath. The non tribals keep the said rice grains in the courtyard to donate it as alms to a Dom beggar who usually visits the villages after every eclipse. This offering of the rice to the mendicant is not found among the tribals here. The Asur store the eclipse-exposed rice grains inside the house carefully and utilise it in future as medicine whenever they are indisposed. The Bedia, Oraon, Munda and the Karmali keep the rice grain in the courtyard to utilise the same for a special ritual. After the eclipse is over, individual members take bath and smear the house with cowdung paste for the preparation of Laxmi puja. This smearing of the house is done by an elderly woman. In this Laxmi puja, no anthropomorphic figure is used as goddess but cow is worshipped as the insignia of goddess Laxmi. The cow is bathed and kept in the courtyard. A paste of turmeric and milk is smeared on the forehead of the cow. A fowl, preferably black in colour, is slaughtered and the eclipse-exposed rice grain is mixed with the blood of the fowl for offering the paste to the cow. Unlike the belief that the cow is a harbivorous animal, the cow is fed with a portion of the paste. The rest part is consumed by the members of the family as *prasad* (auspicious offering). The head of the family officiates in this ritual. It is, however, felt here that this ritual of cow worship has been universalized in the name of Laxmi puja.

The Oraon, Munda and the Asur, in addition to all these, prescribe another act. They, before the eclipse starts, keep their hunting and agricultural implements and a piece of iron bar on the roof to get these exposed to the eclipse. After the eclipse is over, all impliments are taken down and kept in the courtyard. The iron bar is used, in future, as the raw material for the preparation of other household articles and implements. The Asur, in addition to the same practice, prepare iron bangle from the eclipse-exposed iron bar and put it around the ankles of children with the belief that these children will never be attacked by lightning and thunderbolts.

In the case of childbirth during eclipse there are different practices by the tribal and nontribal groups. The nontribal people believe that the birth of a child during eclipse is a momentous thing and hence they perform a ritual soon after the eclipse is over. The members of the family, specially the eldest member and the father of the new born, take one ornament made either of gold or silver and touch it on the forehead of the baby. It is believed that the baby has been born with a good luck but evil shadows are on him. Hence, to ward it off, gold or silver has to be touched on his/her foehead. The gold or silver is then donated as auspicious alms to a Brahmin priest. The tribals believe that the birth of a child during eclipse is an inauspicious event and hence they keep some rice grain beside the newborn baby which is later dispersed outside the house during night. They believe that this throwing away of rice grain will ward off the evil shadows present with the baby.

There are other prescriptive and proscriptive norms too for all people as regards household chores and other related works. During eclipse food is not cooked and also nothing is consumed as it is believed that foods get spolit during ecilpse. A woman in menstruation cycle is not allowed to go out. However, some males go out but do not look at the sky. But the prescriptive norm is to confine oneself inside the house. A pregnant woman is forbidden to lie down on bed otherwise

she will give birth to a paralytic baby and she is also forbidden to cut vegetables which may otherwise lead to the birth of a deformed baby. Whether the belief can be substantiated with case studies or not was the paramount question. A case was then registered by the author. An Oraon youth named Etto Tirkey, aged 18 years, was noticed having a deformed left hand since birth. It was learnt, from an exclsuive interview, that his mother during her pregnancy in 1977, had chopped a cucumber during the Solar Eclipse which occured on 12.10.1977. After the birth of the baby it was noticed that the boy, now Etto Tirkey, was born with the deformed left hand. Hence, the beleif perpetuates quite reasonably among both the tribal and non tribal groups here. Regarding spoiling of food it is a belief among the nontribal people here that during eclipse cooked food, if stored previously, gets the shadow of pollution and hence taking it means becoming a debtor to the Dom King who is conceived of as an untouchable caste group man. Thus, the concept of purity and pollution is visible here in terms of caste ranking as well as mythical belief.

Today communication has played a key role in disseminating knowledge. The nontribal people and the tribal people who live in close proximity get the information of eclipse from two sources, one traditional and the other modern. Traditionally, they get the intimation of eclipse from the Brahmin priest and at the modern day media like radio, newspaper, etc. have played a key role to change the network of interaction among the people here who are informed well in advance. Despite the fact that the media have acted well, people believe that the occurance of Solar Eclipse is not an auspicious event and hence it is not prescribed to watch an eclipse either with naked eye or with protective glasses like Myler filter and so on. It seems apparently here that watching an eclipse is more influenced by traditional belief which cannot be ignored easily from the superstition-ridden mind.

In every society there is an ideational pattern and a situational

pattern which sometimes run parallel to each other or form two opposite strands of thought. The situation is quite difficult to cope up both for a tradition bound man as well as for a well informed scientifically oriented man imbibed with modern day knowledge. Hence, myth and cognition play key roles between these two extremes. The people of Barkakana, who have been discussed here, are no exception to this principle. The mythical belief and cognitive dimension present among them are the ideational systems present in their social organisation. While deciphering the symbolism connected with this ideational system one comes across the situational pattern which is no deviation from the principle. The question that remains, of course, is why the sun and the mon, as opposed, to the human being should be the bearer of this supreme symbolic function. The sun and the moon supply examples for the mind as well as food for the body. They carry not only loads of time and space, but principles too. The crux of the explanation of the apparent universality of the sun and the moon as images of profoundest symbolic significance would seem to lie in the fact that these are both within all, as part of the enduring biological heritage as human beings, and also, by definition, outside and beyond human society. The image of the symbolic sun and the moon is, therefore, necessarily dualistic image, structurally homologous with the duality in human society and the human self between the real and the ultimate ideal, the actual and the longed for, even if subconciously.

In a different strain of analysis certain dyadic principles are observed. Despite the fact that the tribals and the nontribals live in close proximity, observe almost similar pattern of observances and almost similar trend of prescriptive and proscriptive norms, they differ in terms of their mythical belief. The tribals only radiate the concept of sun and moon in different forms whereas the nontribals have brought in the concept of caste element in the myth by including the character of Dom king. In Hindu society where the concept

of purity and pollution is based on the hierarchic pattern of caste structure, the Dom occupy the lower rung of the society, and hence, pollution of food and other related things have been ascribed to the presence of Dom element in the belief. During birth of a child the nontribals use gold and silver and later on donate the same to the Brahmin priest for posterity of the child because the Brahmin who occupy the highest rung in Hindu society, is considered auspicious in every Hindu ritual. Here again the caste structure plays te key role in performing the acts. Contrary to this, the tribals do not perform such ritual but for posterity of the new born baby they throw away rice grains in the dark. These principles are again binary in nature. The people, irrespective of their ethnic affiliation, have the cognition that the Solar Eclipse is more important event than the Lunar Eclipse. It is so because, in Lunar Eclipse, which always occurs in the full moon night, ritual observances do not occupy major role whereas the total darkness in the sky, during Solar Eclipse, compels one to perform certain duties as man is privileged to do more work during day time. Hence, the dyadic nature of cognition is also observed here.

To some, myth is a category of man's creation, a category incapable of definition or explanation by conventional theories (Kirk, 1970). To others, myths can never be viewed as useless relic of the past, an empty survival. It can be taken as affirmation of social identity, history, values and beliefs. The two parallel strands of thought–the formal analysis of the symbolism of the sun and the moon and the critic of social anthropology come together in juxtaposition as compared with Western ideals. The meaning of the symbolic celestial objects remains always in human mind like the sun and the moon itself in some measure beyond conscious and rational comprehension.

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A note on the solar eclipse

William Ekka

For collection of information about the concept of solar eclipse prevalent among the rural people, especially the tribals and their beliefs and practices associated with this astronomical phenomenon a study was conducted in some villages around Barkakana and Ramgarh in South Bihar where a large number of scientists had converged for the study of total solar eclipse which occured on 24th October, 1995. The villages which were visited for study are Barkakana Basti CIC Line Par, Pahanbera, Willong, Kataliabera and Kairarbihar. Barkakana Basti has a mixed population of Gowala, Munda, Kurmi, Karmali, Chamar, Oraon, Bedia, Kalal and Dusad. Pahanbera and Urloong villages are inhabited exclusively by Munda and Oraon respectively. These three villages had been visited on 23rd Oct. 1995. Barkakana Basti was again visited on 24th Oct. 1995 after the eclipse was over. Kataliabera also has a mixed population of Bedia, Gop (Gowala) and Munda. Kairabihar is totally a Bedia village. Kataliabera was visited when the eclipse began to set in. Our study team was at Kairabihar when the sun was totally eclipsed.

In these villages people had learnt about the eclipse mostly from news papers and radio. A very few who have T.V. sets came to know about it from T.V. news. Some informants said that they knew about the occurrence of solar eclipse from the almanacs also. From the mass media they came to know

that it was harmful to look at the sun during the eclipse with naked eyes as it might cause blindness. As this matter was often discussed and talked about in the villages it got communicated to one and all. Due to the fear of losing eye-sight the people who were mostly interviewed in group said that they would not look at the sun during the eclipse. Only a Chamar boy of Barkakana Basti said that he would see the eclipse with one eye. But as our post-eclipse interview reveals he did not see the eclipse. In fact he did not venture out of the house. However, one Chandra Mohan Munda (34) said that he had looked at the sun with naked eyes. From what he said it appears that he had seen just before the total solar eclipse. From the mass media they had learnt that they should exercise precaution for looking at the sun during the eclipse. Thus they heard about the mylar glasses and X-ray plates. But as these things were not available to them they could see the eclipse. But some people might have seen it in the water contained in a plate as Luru Munda of Barkakana Basti did. In Kataliabera and Kairabihar the people saw the solar eclipse through the X-ray plates which we had carried. They would not have seen it, as they said, without it. They would have remained inside the house during the eclipse. An informant saw the solar eclipse from beginning to the end in the sunlight which fell on the floor through the holes in the roof of the house. This method of seeing the solar eclipse by the tribals of Hehal Basti also of Ranchi has been reported in Prabhat Khabar (25.10.95). This time the people had come to know from different sources, especially the mass media, that there was a possibility of permanent damage to the eye-sight if the sun was looked at with naked eyes. Hence, some people like Mukesh Munda of Pahanbera and Sonaram Oraon of Urloong were deterred by it from seeing the eclipse this time even in the water contained in a plate or through X-ray plates.

The scientific reason for the occurrence of solar or lunar eclipse is not known to the people of the villages which were visited. They have no answer to why eclipse occurs. But from what they had observed in the past they could tell that when

eclipse occurs the sun or moon gets darkened for some time. Only one person, Krishna Oraon of Urloong who has studied upto class VIth, said that his teacher had told him that solar eclipse occurs when the sun hides behind the moon. Other than him noboy even the boys like Bimal Munda and Mukesh Munda of Pahanbera who have studied upto Intermediate standard could tell the scientific reason for solar or lunar eclipse.

Similarly the people of the villages which were visited have no knowledge about the Hindu myth i.e. the churning of ocean by the gods and demons which goes to explain lunar or solar eclipse mythologically. Even the people belonging to Chamar, Dusadh and Gowala communities which form parts of Hindu society are ignorant of this myth. What appears to be a somewhat popular belief of the villagers about the solar or lunar eclipse is that the sun or moon get darkened when the Dom king catches hold of them to realise the loan (foodgrains or money) he had given to them. After realization of the loan he relieves them of his hold. But the people seem to be half convinced about it. Lack of conviction is evident in it. However, as the custom which is somewhat commonly associated with the eclipse indicates that this story is mostly accepted to account for the solar or lunar eclipse. What appears to be a common practice in these villages when the eclipse occurs is that rice or paddy with coins of 25 or 50 paise are kept on the roof of the house in a metal, bamboo or leaf container after the members of the household touch them. This is done by women. Next day, they say, the grains and the coins are given to the Dom who come to the village. But this custom is not followed by all the households. In all the households the foodgrains and coins are not kept on the roof. Similarly there is a confusion about the recepient of these things. By custom they should be given to the Dom. But in Pahanbera Subaso Mundain said that the grains are given away to any Brahman, Dom or any beggar. In the Oraon populated village, Urloong, they said that it is given to anyone

who comes there to take. The Bedia do not practise this custom as the inquiry reveals in Kataliabera and Kairabihar. However, this custom is widely practised in tribal Bihar as Dr. Prakash Oraon, Director, Tribal Research and Welfare Institute, Ranchi says (Prabhat Khabar, 22.10.1995) that the tribals keep some rice outside the house in a winnowing fan at the time of eclipse. According to him there is a folk tale in tribal society which tells that the moon had borrowed rice from the sun, and when it cannot return the loan it hides behind the sun. It causes eclipse. He states that the tribals live under open sky and there is no solid basis to say if the eclipse has any effect on them. Keeping grains on the roof in a container at the time of eclipse is reported among the Bhogtas also of Bolba Block of Simdega sub-division. In some areas of western parts of Ranchi district the tribals ring *ghant* (bell) when the eclipse occurs and shout 'Hari Bol'. They even blow conch shell.

In all the villages which were visited the people follow certain restrictions. During the eclipse they do not do any household, agricultural or any other work. They do not eat food or drink water. The food is not cooked. Food is cooked and eaten before or after the eclipse depending upon the time of its occurrence. Cooked food which remains at the time of eclipse is thrown away or given to the dogs or cattle. The popular belief is that it gets polluted. The concept of pollution comes from Dom king, a character in the story of eclipse. The Dom is a very low caste and even the shadow of a member of this caste can pollute anything or anyone. Because of the polluting effect the villagers tend to believe that the moon or sun darkens when touched by the Dom. In their cognition dark or black colour represents pollution. This is clearly implied in what they say at least in this context. During the eclipse they keep themselves indoors. They do not venture out of the house because they are afraid that some evil may befall them. But they are quite confused about the type or nature of evil which may befall. A Bedia of Kataliabera said that one may even be

struck by lightning. But they attend to the nature's call. The children are given strict order by their parents to confine themselves to the house. Pregnant women strictly adhere to this restriction as it is believed that the eclipse would cause deformity to the child. It is also believed that if they cut vegetable or anything during the eclipse the hands of their children may be deformed. A boy with a deformed hand was produced before us in Barkakana Basti and the people as well as his aunt ascribe his deformity to it that his mother cut something during the eclipse when she was pregnant. In Urloong also it was reported that there was a boy these with deformity caused by eclipse. Religious performances also are postponed until the eclipse is over. This year Sohrai, a tribal version of Diwali, fell on the day of solar eclipse. They did not perform Sohrai puja in their cattle shed until the eclipse ended.

It was informed that restriction on taking of food and drinking water may be relaxed in case of children if they are persistent in their demand and cannot be talked out of it. It was also informed by Sonaram Oraon of Urloong that in the past when people were ignorant, cooked food which remained at the time of eclipse was not thrown away. It was eaten after the eclipse. But now, he says when the people are getting wise or gaining knowledge they throw away the cooked food. It, in fact, implies the increase in the degree of their culture contact.

Though they say that they do not do any work during the eclipse it was observed at Kairabihar that an old woman was smearing the courtyard with cowdung, and sound of pounding of grains was heard during the solar eclipse. Similarly difference in what they say and do was found in Barkakana Basti where of all the things an informant was drinking when the solar eclipse had begun.

Keeping indoors during eclipse is observed rather strictly. When our study team reached Khairabihar the village wore a deserted look. Nobody was seen in the village street. At

that time the sun was almost half eclipsed. A woman was seen frantically looking for her small son to take him home. She was shouting angrily because he did not pay heed to her words to keep indoors during the eclipse.

If our study team had not gone to Kataliabera and Khairabihar the people of these villages would have confined themselves to their houses. In both the villages the people came out of their houses to see the eclipse with the X-ray plates which we had with us. In Khairabihar about 6-7 Bedia saw dark sun, Bailey's bead and corona in our company.

In Khairabihar it was reported by a Bedia informant that if an iron piece is kept outside the house during the eclipse and if any weapon such as arrow-head, knife, axe, etc. is made of it, its efficacy is good in its function. The axe or knife can be used on auspicious occasion for sacrificing goats or chickens to the deities. This practice, however, does not seem to be known to one and all.

From what has been written in this note it is evident that the people are ignorant of the scientific reason for solar or lunar eclipse. With regard to the eclipse they have a confused concept of pollution which is manifested in certain practices they have. It is because of the concept of pollution they take bath after the eclipse. Water washes of dirt. It also purifies ritual or socio-religious pollution. Taking bath after eclipse means removal of pollution which one might acquire by being touched by a Dom. But they cannot properly articulate their idea of pollution at such a time. Eclipse is a phenomenon which is incomprehensible to them. It appears unnatural to them. Hence, they are afraid that something evil may befall them. This is the reason why they keep indoors.

In the practices associated with eclipse which have been described above there is a lack of uniformity and universality. For instance, in all the households of even the same village foodgrains are not kept on the roof. Containers for keeping the foodgrains also are not of the same material. Besides it

there is some confusion about the time when it should be kept on the roof. The Dom story also is not well known to all the villagers. All this creates an impression that the people of the villages which had been visited have a very confused idea about solar or lunar eclipse, and lack of universality of the customs associated with eclipse suggests that they are on the peripheral zone of the area in which they operate. It can be summed up that the collective concept of the people of these villages regarding the solar or the lunar eclipse and associated customs and taboos have not been fully crystalized, and these may be attributed to the slow process of attaining a level of social awareness.

Socio-cultural impact of the total solar eclipse on the tribal people of Barkakana

Dalapati Murmu

The total solar eclipse is a rare phenomenon occurred in this universe from time to time. It is always a surprise not only for the common people but also the scientists of the world to study the several hidden clue of the sun. This is the only opportunity that the scientists can study the sun's atmosphere and give to the public a lot of information about the composition and nature of other nearest stars. So, the jubilant scientists of the country even outsiders rush over to those spots from where the total solar eclipse can be studied. It is well known to all educated persons that the solar eclipse takes place when the moon comes in between the sun and the earth. These three bodies should be exactly aligned with one another and casting a shadow on the sun. However, this time the total solar eclipse occurred in South-Asia. The eclipse started in central Iran and ended somewhere in Pacific ocean just after 12.45 p.m.

Several myths and superstitions have been associated with this natural events even today. When the devotees see the crucial situation of their sun god, they make noise loudly by beating utensil plates, drums, blowing conch shells, etc. to scare away these evil demons.

The present paper is based on the data collected in five villages such as C.I.C. Basti (3 kms), Pahanbeda (5 kms), Urloong (6 kms), Kataliabera (3 kms), and Kairabihar (6 kms) all are situated in the North of the Barkakana town in Ramgarh

district. Barkakana is a small town at a distance of 59 kms. from Ranchi city and is 5 kms. in North from Ramgarh, a military cantonment, and 58 kms. from the district headquarter in South by road. Barkakana was the place where the maximum duration of total solar eclipse was 74 seconds and these villages were coming under this total solar eclipse path as well as close to the town where it was possible to study urban situation too. The three villages, *viz.*, Pahanbeda, Urloong and Kairabihar are exclusively tribal villages inhabited by the Munda, Oraon and Bedia community respectively. But rest of other two villages were multi-ethnic villages and closer to the urban influences. The EIC basti is composed of nine caste groups, *viz.*, Gowala, Kurmi, Munda Kurmali, Chamar, Oraon, Bedia, Kalal and Dusad with 150 household. Similarly, the Katalibera is inhabited by three communities, *viz.*, Munda, Bedia and Gope only.

The news of total solar eclipse was spread like a forest fire. The present villagers of all three villages also came to know about the present solar eclipse through the various modern media, *viz.*, daily newspapers, radio, television and also through the conversation with other caste people who used to come to these villages for various purposes. Mr. Sonaram Minz (45 years old), from village Urloong came to know through his own television and also through his friend circle during his duty at C.C.L., Sirka. The other people of the same village also came to know through Mr. Muniram Paswan (46 years old) who came to this village to sell fried *chana* (grams). Mr. Jagadish Bedia (45 years) and Mr. Dinesh Bedia (30 years) of Kataliabeda stated that they have come to know through daily newspapers as well as through *Panchang* (almanac). Besides these, most of the tribal people and non-tribals went to Barkakana and Ramgarh town as daily wage labourers, some are also employed at local C.I.C., C.C.L. factories and mines from where they came to know all about this great event. Apart from these, they came to know during their frequent visit to Barkakana and Ramgarh town for several

purposes. They had seen a huge number of people, came from outside and stayed in all hotels and several private and government institutions to study the total solar eclipse since a week. Many scientists had come from several research organisations of India, even outsiders along with their sophisticated scientific equipments and put-up their respective tents at Ramgarh college ground to study and take photographs of several stages of the sun during the eclipse, some of the parties had occupied better position on top of the hill to take better photographs.

In Barkakana, the eclipse started at 7.29.42 a.m. and completely covered the sun at 8.44.23 a.m. when the sun was blotted out completely, the darkness was deeper than at normal sun set. A bright star, might be the Venus, appeared very close to the sun for a moment during the total solar eclipse.

The tribals of these villages are not aware of any traditional tribal myths related to eclipse. They came to know about indistinct myths from the local Hindu community that once the sun borrowed some rice from Dom Raja, belonging to scavenger community. According to the Hindu system of caste hierarchy, the Dom belong to an untouchable community. Due to some reason the sun was unable to repay his debt. So, the Dom Raja touched the sun for which it became blocked i.e. polluted. During the eclipse, the people of every caste groups put some uncooked rice alongwith a coin in a container and after touching the container everybody of their respective family keep the same over the roof of the main entrance during the eclipse to assuage the Dom. They believe that by offering this, their sun god will be freed from the Dom. This offering is not taken back by them. It is given away to the Dom after the eclipse who come to collect this offer from every family. Here in the C.I.C. basti, it is seen that Mrs. Jatni Devi, wife of Mr. Visheshwar Munda had put some uncooked rice alongwith a silver coin in an alluminium plate

and kept over the roof of their main entrance. Similarly, Mrs. Jhunia Devi, wife of Mr. Lurhu Munda followed the same procedure by keeping some uncooked rice alongwith 50 paise in a *tupla* (a small bamboo basket). They said that Turi (basket makers) come from Ghutua village and collect these offerings from every family. But in the Urloong village the Oraon put some cooked or raw rice in a leaf plate and kept on the *chhan* (roof) in the evening which were eaten up by birds or domestic fowls. But in Kairabihar, no such practice is observed by the Bedia.

The people here came to know through various media as mentioned earlier and public contact about the harmful effects in watching the eclipse with naked eyes, which may damage the retina and eye sight completely. So, many of the interested people watched the eclipse indirectly through plateful of water as practised earlier. They have seen several partial solar eclipse before it either with naked eyes or through indirect ways. Many people, *viz.*, Chandra Mohan Munda, Dasarath Munda and Hiruram of C.I.C. basti had watched the solar eclipse occurred on 16th February, 1980 directly with naked eyes, but have not been affected so far. But this time they heard from several sources that this total solar eclipse is something unique than the earlier ones and may affect the viewer's eye sight badly who would watch the eclipse directly with naked eyes. So, most of the people were afraid of this eclipse especially the womenfolk. But Mr. Hiruram Rahidas said he would watch the eclipse directly with naked eyes as before. This time he would see it but by closing one eye. If he lost one eye the other will be saved, he added. But it was observed that during the eclipse he kept himself inside the house.

In spite of several warnings issued through media many people of this village watched directly with naked eyes this year too. Some of the people of C.I.C. basti tried to get the spectacles but could not succeed. They said that their present

Sarpanch of this Grampanchayat managed to get such special kind of spectacles from somewhere by payment of twelve rupees only. Many traditional social taboos are also associated with the eclipse which are observed by these villagers. They believe that it must affect the viewers in any form. So, they always avoid some activities which have been considered socially inauspicious for them. To watch the eclipse by a pregnant woman is strictly prohibited and she remains inside the home until the eclipse is over. An instance is narrated by Smt. Mangri Oraon (55 years) of C.I.C. basti. She told that when her grand son Mr. Etto Tirkey (15 years) of C.I.C. basti was in his mother's womb, his mother had cut a gourd for cooking during the eclipse. They believe that Etto's left hand became handicapped on account of that only. So, they avoid to take meal, to drink, to cook food and to cut vegetable etc. during the eclipse. They also give up cooked food of previous day. But the tribals of other villages do not observe these taboos strictly. It is also seen that many people of the Kataliabera village released their cows for grazing before the eclipse was over. The people of Pahanbeda are less interested about eclipse. The womenfolk were busy cleaning and smearing their houses for celebration of their great *Sahrai* (Deepavali) festival. Mr. Jagadish Bedia (45 years) and Dinesh Bedia (30 years) of Kataliabera said that the eclipse is a good opportunity for *Ojha* (medicine man) to attain success the *mantra-tantra* (charms and spells). Similarly, the Bedia of Kairabihar believe that it is an auspicious occasion for preparing any iron implements. So, the willing people keep some iron pieces in the open air during the eclipse so that some supernatural powers may impose on it and later on they prepare some desired implements with it like arrow head, special kinds of knife blade for cock fighting locally known as *Kaeth* and so on.

During the solar eclipse, the tribal villages, especially the Kairavihar remained very calm and quiet. The people stayed inside their respective houses especially the women-folk and

children. It is already mentioned earlier that the total solar eclipse coincided with the great Hindu festivals Deepavali. So, the people stayed at home with some anxiety and fear and waited until the eclipse was over. Because no religious function or worship can be performed during the eclipse. Even the domestic animals were not allowed to graze without performing the Gohalpuja (Gobardhan puja). After the eclipse they took holy bath in nearby water source.

The people of Barkakana stated that after this total solar eclipse there was a possibility of great earthquake. It was reported that one of the passenger train stopped near the railway level crossing during the solar eclipse. All local passenger trains were running very late with a very small number of passengers during this period. They did not prefer their journey during this period. Most of the offices as well as Railway staff were on leave on the occasion of local *Sarrai* festival. The State Government had declared a half day leave on the occasion of the total solar eclipse. It was really one of the great attractive events during this era which will be remembered by the people who had watched this wonderful event.

The Mundas at a Midnapore village during the solar eclipse

Abhijit Guha

On 24 October 1995 we were out in the Vidyasagar University Campus' open ground to watch the crucial moments of the solar eclipse. A kind of dying sunlight was spreading all over, the temperature had fallen quite a few degrees and we were continuously borrowing from each other the recently procured specially made eclipse watching spectacles, made by Paschim Banga Bigyan Mancha. I was in fact searching for an individual coming down from the adjoining tribal village named Muradanga inhabited by the Munda, Oraon and a few Bhumij families. Within few minutes I saw two men coming down from Muradanga, one young man followed by a middle aged person. I approached them and asked: 'Hey, how are you observing the eclipse?' The young man did not seem to pay any attention to my words. He busily passed by and being rather desperate I got hold of the stockily built older man and brought him to our small gathering. He said he would be going for his job downtown. We offered him the spectacles, he saw through it, and admitted that 'it gives good viewing'. Have you observed? He said, 'Yes, and sometimes by the naked eyes too. Nothing happens you know!' His name was Bhupati Singh, he belongs to the Munda community. Our interviews with this man revealed some of their beliefs and practices centreing around eclipse. They used to view it on any container filled with water sprinkled with turmeric. Many of his village fellows have done it this time too. And many men, women and

children, according to Bhupati, will take their bath and meals after the *grahana* is over. But why does it happen? Being faced with this cosmological question, Bhupati smiled and replied 'that is an old, very old story: He started narrating: Many many years ago one of their ancestors could not meet with the payments to be made to their traditional midwife hailing from a low caste group. The *grahana* is nothing but the result of this age-old sin committed by their ancestor. By that time the sunlight was again getting brighter and Bhupati started to move. I took Dr. A. V. Arun Kumar with me (he is an economist who has come from Bangalore to conduct a research project) and walked up towards Muradanga. While entering in the village we found the villagers gossiping in and around the homesteads. Most of the women of this village work outside as day labourers in the rice mills, brick industries and such other in the Midnapore town. I started asking them about whether they were observing any taboos as regards taking of food, bath and going to work. They told us that 'Well we did not go out for work due to holidays on account of the Kalipuja'. But then they said that they had taken tea in the morning before the eclipse started to take place and they will take their bath and meals after the *grahana*. Just at the moment, we entered into a house where we found one old woman on the open space, and started asking her about the eclipse story. She also confirmed Bhupati Singh's account of the failure on the part of their ancestor to make the payment of the midwife. I asked the old woman: 'Are the dues still remain unpaid?' She replied: 'Oh yes, how can other people pay for him? And the eclipse recurrently take place due to that original sin. I asked, but why then it goes away?' She did not at first seem to understand the trajectory of my logic. But after a few moments of thought, she uttered 'how can *grahana*, recur unless it goes away?' While talking to this women we had been observing one old man clad in a shawl was sitting on the small elevated place beside the entrance of the house. He was taking a thick fluid from a bowl (probably the local

drink) and some solid food. I pointed to the old lady about violation of food taboos by this old man. The lady laughed and casually told me that 'look they are the village elders (the *murubbis*), he can do like this! They are exempted from the restrictions to be observed by the common men during the *grahana*.' Then we moved out of this house with the old lady who also left for her home within the village. On the village road we met several men and women and while talking to them we got the smell of alcohol, particularly from the older males. But after visiting the village sacred grove with a young man we met another person who seemed to be a little tipsy. Being asked about what he did during the eclipse the Munda youth categorically stated that he did not observe any taboo as regards taking food and drink. He had viewed the eclipse with X-ray plates and said that only pregnant women should follow certain restrictions. Lastly, the young man offered *pranam* to us and we came out from Muradanga.

The total solar eclipse and the media : a compilation

S. Chanda and S. B. Chakrabarti

The progress of science has made it possible for the entire human population spread over the globe to get plunged into a thrilling experience rendered during the Total Solar Eclipse which occurred in the morning of 24th October, 1995. Started near Tehran in Iran in the early hours, it took about 7 minutes to reach India crossing Afghanistan and Pakistan. Anandgarh happened to be the first village in Rajasthan in India which witnessed this exquisite celestial beauty at 08.30 IST. In India, the total eclipse was durable from 08.30 to 08.50 IST. The people in the ancient world perhaps could not fully calculate such sophisticated mathematical assumptions as to the emergence, spread and exit of the course of the eclipse. But now computer has made it possible. The following table will suggest about the exact timing and duration of the total solar eclipse from 1984 to 2010 as has been predicted by the scientists :

Year and Date	Duration of the total solar eclipse (in minutes)	The place of occurrence
22-11-1984	2.1	New Guinea, Chile
24-3-1987	0.3	Atlantic, Africa
18-3-1988	4.0	Phillipines
22-7-1990	2.6	Finland, North Asia
11-7-1991	7.1	Hawaii, Middle America, Brazil

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Contd. from pg. 53

30-6-1992	5.4	South Atlantic
3-11-1994	4.6	Chile, Brazil
24-10-1995	2.4	Iran, India, Vietnam
9-3-1997	2.8	North-East Asia
26-2-1998	4.4	Middle America
11-8-1999	2.6	Europe, India
21-6-2001	4.9	South Africa
4-12-2002	2.1	South Africa, Australia
23-11-2003	2.0	Antarcica
8-4-2005	0.7	South Pacific Ocean
29-3-2006	4.1	Africa, Russia
1-8-2008	2.4	Siberia, China
22-7-2009	6.6	India, China, South Pacific Ocean
11-7-2010	5.3	South Pacific Ocean

Lot of superstitious beliefs are replete with mythological stories in almost all parts of the world. In our Puranik stories it is told that the whole universe rested on one part of the hood of Basuki. When it feels tired the entire weight of the universe is shifted on the other part of the hood and thus creates an earthquake. During this time the rate of sin also increases. That is why, the demon Rahu swallows the sun. In ancient China there are stories which suggest that wild animals swallow the sun. Among the Red Indians it is believed that the light of the sun is put off for some time and that is why the eclipse occurs. The Eskimos believe that the eclipse occurs due to the suffering of the sun from some diseases. These sort of ideas and beliefs are very common among different communities in the world.

With the passage of time many such beliefs have changed and some are in the process of change. Even there are some elements in these structured beliefs of man which have not yet shown any change. Notwithstanding all these varied experiences the people in our country were exposed this time to a huge mass of information generated through all kinds of media and mass communication platforms.

A total solar eclipse is indeed a very rare event at any place on the earth. In connection with total solar eclipse on October 24, 1995 the Govt. of India identified some places as 'National Observation Spot' or the place of totality where 100% of eclipse could be seen. Accordingly, Ramgarh, Ratnagarh, Fatepur, Nalgarh, Alwar, Bharatpur, Fatepur Sikri, Dhawalpur, Bind, Jalawan, Kalpi, Hamidpur, Allahabad, Robertganj Churka, Gaura, Daltanganj, Barkakana, Lohardaga, etc. have been marked as national observation spot. In West Bengal, places like Basanti, Diamond Harbour, Falta, Kulpi, Baruipur, Kalyanpur, Laxmikantapur, Jaynagar, Budge Budge, Magrahat of South 24 Parganas, Tamluk, Midnapur, Kharagpur, Paskura, Haldia, Ghatal, Chandrakona of Midnapur district, Howrah, Gadiara, Uluberia etc. of Howrah district and the district Purulia have been marked as the national observation spot. Besides, certain areas like Calcutta, Krishnanagar, Bankura, Santiniketan, Asansol, etc, have been marked where visibility of eclipse was about ninety per cent.

The previous occasion was on May 10, 1575 during the reign of the emperor Akbar. The last path of an eclipse passed within 50 Km. of the present city of Bangalore was in July, 1293; the next time it will be in July 5, 2168. Statistically, the chances are once in about 350 years for any place but even then enormous deviations from the mean can occur.

Over the present century five total solar eclipse could be visible from parts of India. Four of them have already occurred. The first one was on August 21, 1914 when the path ended over the Rann of Kachchh. A similar one occurred

just north of it on June 30, 1954 and ended at sun set over the Rajasthan desert. The third one happened on February 16, 1980, the duration being about 3 minutes and passed over the area of Karnataka, Andhra Pradesh and Orissa and Mizoram. It happened in the afternoon while the sun was still quite high in the sky. The last one occured on October 24, 1995. The final one will occur, as the scientists anticipated, on August 11, 1999 and will be visible from Gujarat, Madhya Pradesh, Andhra Pradesh and will end over the Bay of Bengal at sun set.

Although the eclipse of October 24, 1995 was of shorter duration than that of 1980, it also passed over thickly populated areas of northern India and was witnessed by millions of people. This was a significant achievement brought about by the coordinated and combined efforts of a vast number of scientific organizations and mass media.

On the day of the eclipse the Doordarshan organised a live telecast of the eclipse and related scientific experiments from Neemka Thana in Rajasthan, Allahabad in Uttar Pradesh and Diamond Harbour in West Bengal. The programme was co-ordinated from Delhi Doordarshan and millions of viewers from all over India could see the various phases of the eclipse, including Bailey's beads, the corona and the diamond ring effect more than once.

For Indian astronomers and other scientists the total eclipse provided a rare opportunity to conduct a series of experiments to determine the solar diameter, the structure of the solar corona, its temperature and density profiles, the mechanism of coronal heating, the distribution of coronal holes and their sizes, etc. The results from these experiments are expected eventually to enrich our understanding of nuclear fusion as an almost unlimited source of energy and likely to help in predicting the behaviour of earth's lonosphere and weather patterns. The Department of Science and Technology, Government of India, provided the research grants to enable these experiments to be planned long in advance and also

helped in facilitating foreign scientists to participate in many experiments. The activities were coordinated by the Indian National Science Academy and the Indian Astronomical Society. Although many of these experiments had been performed already in 1980, this time the sophistication of the experiments made all the difference to the quality of generated data and its subsequent analysis.

Many of the experiments were carried out at Neemka Thana and Kalpi in Rajasthan and were planned and coordinated by Indian Institute of Astrophysics, Bangalore; Solar Observatory, Udaipur; Physical Research Laboratory, Ahmedabad, Uttar Pradesh State Observatory, Inter-University Centre for Astronomy and Astrophysic, Pune and Indian Air Force.

At Diamond Harbour though the weather experts had predicted a chance of rain and cloudy sky, yet it was absolutely clear. The teams who conducted the experiments there came from the Eastern Centre for Research in Astrophysics (ECRA) which includes Institute of Radiophysics & Electronics, Bose National Centre for Basic Science & the Saha Institute of Nuclear Physics and other allied subjects. The Birla Planetarium also conducted research work on Astrophysics in Diamond Harbour and in Iradatganj near Allahabad. The Positional Astronomical Centre, Calcutta also conducted experiments both in Robertganj (U.P.) and in Falta (W.B.). The Indian Institute of Geomagnetism, Bombay carried out experiments both in Purulia (W.B.) and in Allahabad. The IUCAA (Pune) and the IIA (Bangalore) also carried out some experiments on solar eclipse.

Besides, various small scientific organisations, amateur astronomers, science club, students of science of various educational institutions also observed some interesting phenomena during the eclipse which are noted as follows :

(1) A distinct fall in temperature. A drop of 6 degree centigrade was noted initially just before the eclipse and then the temperature dropped to 25 degree

centigrade at the time of eclipse and a cool breeze started blowing-the reason for which is still undetected.

(2) Reduction in light intensity was 95%

(3) Animals became very quiet, supposing it was night time. Nocturnal animals such as bats, pangolins and certain types of monkeys were found to behave normally at the Alipore Zoo and else where. Flying birds were much confused. Most of the birds flew back to their nests only and set about again after the sun rose for the second time a little later.

(4) The peacocks were found dancing.

(5) No change has been observed in the habits and movements of insects and fish and certain animals.

(6) Physiologists detected a rise in the pulse pressure from normal 6 mm to 80 mm of mercury on the morning of eclipse.

In contrast to the eclipse 1980, this time media played a significant role to disseminate scientific knowledge to the public with the object of motivating them in acquiring greater scientific awareness.

For months together before the actual date of solar eclipse, various scientific organizations like Bharat Gyan Vigyan Samity, India's People Science Network, National Council for Science and Technology Communication, Confederation of Indian Amateur Astronomer, Centre for Astronomy and Astro-physics Research, Pune; Positional Astronomical Centre, Calcutta; Paschim Banga Vigyan Mancha, Astronomers' Association and other various scientific organisations including Birla Planetarium organised lectures, talks, etc. and supplied pamphlets, leaf-lets and so on. The mass media also played an important role in educating public about eclipse through their publication of articles, reviews and short notes and tried to impress upon them regarding their age old superstitious beliefs and practices. Besides, the Doordarshan also played a vital role in disseminating knowledge about the eclipse.

These kinds of propagations helped people to have a better understanding about the eclipse and brought some confidence and rational views in observing and understanding the celestial phenomena. Many schools and educational institutions organised tours for their pupils into the command area of the solar eclipse. This was in great contrast to what happened in 1980 when most people simply confined themselves in their homes.

The people in general got so much excited that they took initiative to acquire a viewing medium like carbon paper, x-ray film, negative film, dark film used for car windows and screens, goggles, weilding glass, mylar glass and special type of spectacles for observing the eclipse.

Despite the positive role played by the media and the scientific organisations certain sections of people irrespective of their caste, creed and religion were reported to cling to their old ideas and norms of life. They did not watch the eclipse. Certain restrictions regarding taking of food and water and cooking as well as movements were also maintained by them. People performed suryanamaskar (worship of the sun). Pregnant women were not allowed to move, to chop vegetables, or to knit at the time of the eclipse. For many it was a mixed feeling. Some people understood all the scientific background about it but were unable to break the norms set by their old parents and grand-parents. People took holy dip in water to cleanse their souls of the past sin. Some of them put tulsi leaves in water and milk to keep them pure.

Inspite of the best role ever played by the mass media and in the context of public awareness, certain reported trends indicate the people's faith in traditional ideas and norms.

(1) Everywhere temples were closed down at the time of the eclipse. In Calcutta, the Kalighat temple, the Hanuman temples were also closed down but opened soon after the eclipse and people were allowed to worship.

(2) some burning ghats ceased work during the period of eclipse.

(3) The muslim devotees offered Namaz-e-Kasoof - a special prayer for the sun and the moon with a view to appease Him and to inform people that only Allah can rescue mankind from such calamities.

(4) Many people in the neighbourhood lit candles outside their houses and blew conchshell.

However, by and large, people were visibly excited this time regarding this celestial splendour on the one hand and the consequent confusions generated also through some media. It was not easy to identify immediately the socio-economic category of these people behind either total acceptance or rejection of the ideas propagated through various media.

But one thing was thinly apparent that the people of older generation irrespective of their caste, creed and religion still preferred to follow the traditional norms and values on such occasions.

It was a proven fact that the role of the mass media and scientific organisations in disseminating scientific knowledge helped much to the younger generation in enhancing their progressive ideas. As a result they tried their best to break the old norms and enjoyed much in viewing the eclipse without any prejudice.

Sources

The Times of India		Dt.23.10.95,24.10.95 & 25.10.95
Ananda Bazar Patrika		Dt.23.10.95,24.10.95 & 25.10.95
The Statesman		Dt.22.10.95 – 25.10.95
The Telegraph		Dt.23.10.95,24.10.95 & 25.10.95
Bartaman		Dt.22.10.95,23.10.95,24.10.95 & 25.10.95
Aajkal		Dt.23.10.95,24.10.95 & 25.10.95
Ganashakti		Dt.23.10.95
Anandamela	-	Sept.'95
Frontline	-	Dt.17.11.95
Pratikshan	-	Nov.'95

Appendices

A Telegraph - MODE opinion poll

1. Will you be watching the eclipse ? (% saying yes)		2. Will you watch with naked eye ? (% of those planning to see eclipse saying yes)		3. Those not watching : Why ? (% of those not watching)	
Total	43	Total	27	Against custom	8
Men	53	Men	24	Bad for eyes/don't	
Women	34	Women	30	possess filters	68
Poor	35	Poor	60	No time/interest	22
Middle Class	44	Middle Class	10	Health minister's advice	2
Affluent	53	Affluent	18		

4. Will you follow superstitions like not eating during the eclipse and throwing away all food cooked before the eclipse ?
(% of total sample)

Will follow	49
Aware, believe but will not follow	2
Not aware of superstitions	5
Do not believe superstitions	44

Based on a sample of 220 Calcuttans interviewed on Sunday

The media hype and the mass awareness campaign on Tuesday's solar eclipse have not been able to dispel fears about watching the solar eclipse. Only 43 per cent of the city's population are interested in viewing the phenomenon, according to a snap opinion poll. The health administration has a major problem in hand because nearly 60 per cent of the poor who want to watch the eclipse will do so without solar filters. And nearly half the city's total populace is still steeped in superstitions and will not eat during the period of the eclipse.

Who is at risk, when ?

* Prolonged gazing. Even filters do not block ultra-violet rays.
* Highly pigmented eyes.
* High body temperature as in hot climate, after vigorous exercise or during fever.
* Children.
* Those at high altitudes.
* Those operated on for cataract.
* Those near reflecting surfaces - snow covered hills or while flying over clouds.

Source : Ministry of Health

What's in view

Corona: The sun's outer atmosphere, it consists mainly of hydrogen. Actually a spray of gas which the sun blows out into space, the corona forms a feathery, pale cloud that surrounds the sun and extends millions of kms out. Temperature: about a million degrees.

Shadow Bands: Wavy lines seen rapidly moving across the ground just seconds before and after a total solar eclipse. An atmospheric phenomenon, shadow bands appear as ripples of dark and white bands on any white smooth surface.

Bailey's Beads: Casued by the shining of the sun's rays through the valleys of the moon's irregular profile, these can be seen immediately before and after a total solar eclipse.

Diamond Ring: A luminous ring, the glitter of which is enhanced by the darkness that engulfs the sun during an eclipse, it becomes visible when only a speck of the sun remains in view, just before or immediately after a total solar eclipse. The bright speck is the "diamond", the inner corona.

Contact Points: These are the points where the discs of the sun and the moon seem to meet and part as seen from the earth. A total solar eclipse shows four distinct contact points.

How to watch

Exposure of the naked eye to the sun's direct rays is injurious. The brightness, combined with the ultraviolet and infra-red radiation, can result in partial or permanent blindness. Using dark sunglasses reduces the stress on the eyes. The best way to watch an eclipse is through a double strip of exposed black-and-white photographic film or dark X-ray plates.

Source : India Today (31.10.95)

Duration of eclipse

Place	Duration of total phase (Sec)	States	Communi-cation		Mode of Travel	Clear-Sky Days-in-October (%)
1. Ratangarh	49	Rajasthan	Delhi	Bikaner	Rail	75
2. Fatehpur	52	"	Ratangarh	Sikar	Road	75
3. Nawalgarh	51	"	Sikar	Jhunjhu-nam	Rail/Road	75
4. Nim-ka-thana	53	"	Delhi	Ajmer	"	75
5. Alwar	50	"	Delhi	Jaipur	"	70
6. Lanchhman-garh	52	Rajasthan	Alwar	Lanchhman-garh	Road	70
7. Fatehpur-Sikri	50	Uttar Pradesh	Agra	Fatehpur-Sikri	"	70
8. Bhind	69	Madhya Pradesh	Etwah	Gwalior	"	70
9. Kalpi	61	Uttar Pradesh	Kanpur	Jhansi	Rail	70
10. Hamirpur	63	"	Kanpur	Banda	"	60
11. Robertsganj	69	Uttar Pradesh	Varanasi	Daltonganj	Rail	60
12. Churk	68	"	"	"	"	60
13. **Barkakana**	**74**	Bihar	Ramgarh	Barka-khana	Road	60
			Tatanagar	Muri-bar	Rail	60
			Gomoh	Kakhana	"	60
				Dehri-on-sone	"	60
14. Ramgarh	72	"	*Ranchi	Hazaribagh	Road	60
15. Jhalida	76	"	Dhanbad	Ranchi	"	50
16. Purulia	57	West Bengal	Calcutta	Purulia	Rail	40

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17. Ajodhya	74	"	Purulia	Bankura	Road	40
18. Manbazar	77	"	Bankura	Manbazar	"	40
19. Simlapal	74	"	Bankura	Simlapal	"	40
20. Mukutmanipur	77	"	Jhargram	Mukut-manipur	"	30
21. Baghmundi	69	West Bengal	Bankura	Baghmundi	Road	25
22. Chandrakona	73	"	*Medni-pur	Chandra-kona	"	25
23. Tamluk	76	"	*Panskura	*Haldia	Rail/ Road	25
24. Falta	80	"	Calcutta	Falta	Road	25
25. Diamond Harbour	77	"	Calcutta	Diamond Harbour	Rail/ Road	20
26. Lakshmi-kantapur	78	West Bengal	Calcutta	Lakshmi–kantapur	Rail	20
27. Magrahat	80	"	Calcutta	Magrahat	"	20
28. Raidighi	69	"	Calcutta	Raidighi	Road	20
29. Geokhali	70	"	Calcutta Nurpur	*Nurpur Geokhali	" Ferry-Service	20
30. Basanti	67	"	Calcutta Caning	Caning Basanti	Rail Ferry-Service	20

*Totality can also be seen from these places

Courtesy : Mr. B. Das Gupta, Positional Astronomy Centre, Calcutta.

Source : The Statesman, October 22, 1995.

Total Solar Eclipse
October 24, 1995

Timings of partial-phases for important places

Places	Eclipse Begins (First contact)	Eclipse Maximum	Obscuration	Eclipse Ends (Fourth contact)
	h m s	h m s	%	h m s
Ahmedabad	7 23.5	8 29.9	79	9 45.4
Bhubaneswar	7 30.8	8 46.8	90	10 13.7
Bombay	7 25.7	8 31.0	65	9 45.3
Calcutta	7 32.2	8 49.7	99	10 17.9
Delhi	7 25.0	8 34.1	96	9 52.4
Bhopal	7 25.0	8 34.7	87	9 54.2
Jaipur	7 24.1	8 32.7	98	9 50.6
Kohima	7 38.6	8 58.2	79	10 27.4
Madras	7 33.8	8 42.7	55	10 01.6
Patna	7 29.4	8 43.8	95	10 08.5
Nagpur	7 26.4	8 37.1	82	9 58.1
Srinagar	7 26.6	8 32.9	79	9 47.1
Trivandrum	7 40.2	8 41.6	35	9 51.2

Duration of Partial Phase = Eclipse Ends – Eclipse Begins

(Partial Phase gets two contacts)

Total Solar Eclipse
October 24, 1995

Timings of total phase for important places

Places	Eclipse Begins (First contact)	Totality Begins (Second contact)	Totally Ends (Third contact)	Eclipse Ends (Fourth contact)
	h m s	h m s	h m s	h m s
Alwar	7 24.4	8 33 03	8 33 53	9 51.7
Fatehpur-Sikri	7 24.9	8 34 09	8 34 59	9 53.7
Churk	7 27.8	8 40 43	8 41 51	10 05.0
Ramgarh-Bihar	**7 29.7**	**8 44 23**	**8 45 35**	**10 10.8**
Purulia	7 30.4	8 45 52	8 46 49	10 12.9
Diamond Harbour	7 32.1	8 48 56	8 50 13	10 17.8
Basanti	7 32.6	8 49 49	8 50 56	10 19.0

Duration of totality = Totality ends – Totality begins

(Total Phase has four contacts)

Courtesy : Mr. B. Das Gupta, Positional Astronomy Centre, Calcutta.

Source : The Statesman, October 22, 1995.

Eclipse sequence

The time sequence of the total solar eclipse as watched at Diamond Harbour on Tuesday :

* 7.32 am - Contact point, as the moon started its bite.
* 7.45 am - Partial phase of the eclipse. The sun started taking the shape of a crescent moon.
* 8 am - Shadow bands found on ground, with wavy lines seen rapidly moving across terrestrial features.
* 8.10 am - Daylight began diminishing.
* 8.20 am - Significant fall in day temperature. Cool breeze was blowing. Spectral effect.
* 8.30 am - Bailey's beads appear owing to the reflection of sun's rays on the uneven hilly surface and valleys of the lunar limb, immediately before the totality period starts.
* 8.40 am - Near twilight descended on the ground.
* 8.47 am - Twilight illusion and sun totally blocked by the moon's shadow. Two stars appear on the eastern sky.
* 8.47 am - Totality ended.
* 8.48 am - Flash from south-west side and diamond ring appears as the moon's shadow covers the sun. Partial phase starts again.
* 9.05 am - Three-fourth part of the sun re-emerges.
* 10.15 am - Partial phase ends.

Duration of eclipse

Place	Duration of total phase (Sec)	States
1. Ratangarh	49	Rajasthan
2. Fatehpur	52	"
3. Nawalgarh	51	"
4. Nim-ka-thana	53	"
5. Alwar	50	"
6. Lanchmangarh	52	"
7. Fathepur-Sikri	50	Uttar Pradesh
8. Bhind	59	Madhya
9. Kalpi	61	Uttar Pradesh
10. Hamirpur	63	"
11. Robertsganj	69	"
12. Churk	68	"
13. Barkakhana	74	Bihar
14. Ramgarh	72	"
15. Jhalida	76	"
16. Purulia	57	West Bengal
17. Ajodhya	74	"
18. Manbazar	77	"
19. Simlapal	74	"
20. Mukutmanipur	77	"
21. Baghmundi	69	"
22. Chandrakona	73	"
23. Tamluk	76	"
24. Falta	80	"
25. Diamond	77	"
26. Lakshmi-	78	"
27. Magrahat	80	"
28. Raidighi	69	"
29. Geokhali	70	"
30. Basanti	67	

Photographing the eclipse

Sensitivity of film	Partial-Phase (With Filter)		Total-Phase (Without Filter)	
ASA	Aperture Setting	Shutter Speed	Aperture Setting	Shutter Speed
32	f 4	1/125	f 4	1/8
	f 5.6	1/60	f 8	1/2
100	f 5.6	1/250	f 5.6	1/15
	f 8	1/125	f 8	1/8
400	f 5.6	1/1000	f 8	1/30
	f 8	1/500	f 11	1/15

Tele-Lens Focal-length in millimetre	Image-Size in millimetre
50 (normal lens)	0.5
200	1.9
400	3.5
1000	9.0
1250	11.0

The use of high magnification may cut-off the corona

Source : The Statesman (22.10.95)

TOTAL AND ANNULAR ECLIPSES, 1991-2010*

Date	Type	Maximum Duration	Locale
January 15, 1991	Annular	7m 55s	Tasmania, New Zealand
July 11, 1991	Total	6m 54s	Hawaii, Mexico, Central & South America
January 4, 1992	Annular	11m 43s	Parial: Hawaii, end: California
June 30, 1992	Total	5m 21s	Uruguay, Atlantic Ocean
May 10, 1994	Annular	6m 14s	Mexico, US.
November 3, 1994	Total	4m 23s	S. America
April 29, 1995	Annular	6m 38s	S. America
October 24, 1995	Total	2m 10s	S. Asia including India
March 9, 1997	Total	2m 50s	Mongolia, CIA, Arctic
February 26, 1998	Total	4m 09s	Panama, Colombia, Venezuela
August 22, 1998	Annular	3m 14s	Indonesia, Malaysia, Oceania
February 16, 1999	Annular	1m 18s	Australia
August 11, 1999	Total	2m 23s	Europe, S. Asia including India
June 21, 2001	Total	4m 57s	Angola, Zambia, Mozambique
December 14, 2001	Annular	3m 54s	Pacific Ocean, Central America
June 10, 2002	Annular	1m 13s	Pacîfic ends of Baja California
December 4, 2002	Total	2m 04s	Southern Africa, W. Australia
May 31, 2003	Annular	3m 41s	Arctic
November 23, 2003	Total	1m 57s	Antarctica

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April 8, 2005	Ann/Total	0m 42s	Panama, Colombia, Venezuela
October 3, 2005	Annular	4m 31s	Portugal, Spain, N. & E. Africa
March 29, 2006	Total	4m 07s	Africa, Turkey, CIA
September 22, 2006	Annular	7m 09s	N. E. South America, Atlantic
February 7, 2008	Annular	2m 14s	Antartica
August 1, 2008	Total	2m 27s	N. Canada, N. Greenland, Asia
January 26, 2009	Annular	7m 56s	Indonesia
July 22, 2009	Total	6m 40s	India, Bangladesh, China, S. Japan Is.
January 15, 2010	Annular	11m 11s	Africa, India, Myanmar, China
July 11, 2010	Total	5m 20s	S. Chile, S. Argentina

*Data from F. Espenak, Fifty Year Canon of Solar Eclipse, 1968-2035 NASA Reference Publication 1178 (revised), NASA, Greenbelt, Md.

Reactions of people on solar eclipse in some parts of the country

(As reported in some newspapers)

Assam : Some people confined themselves to indoor for watching the solar eclipse on television. Others witnessed it with great enthusiasm outside their houses. The city in general appeared to be deserted prior to the beginning of the event and till it was over. In Guwahati the solar eclipse could not bring many people out of the room. Almost all shops and business establishments were closed in the morning. A few buses plied between nearest distance. The educational institutions and offices remained closed.

Andhra Pradesh : Partial eclipse was witnessed over Andhra Pradesh and it was very spectacular event In Hyderabad and its surrounding areas. It lasted for about two hours. The sky was clear and visibility of the eclipse was about 74%, the pick of which was at 8.38 am. Most people remained inside their houses during the eclipse. The streets were deserted and markets etc. remained closed including the educational institutions.

Orissa : It was reported that thousands of viewers gathered near the planetarium to watch the solar eclipse since morning. The eclipse was partially visible (92%). The streets and markets remained closed including the academic institutions. Some people refrained themselves from cooking and eating meals.

Punjab : A large number of people including the Sadhus

assembled in the Golden Temple and other important shrines in Amritsar and took a holy bath in the sacred sarowars. Roads and market places remained closed. Most of the people prefered to remain inside the house.

Kanpur : The normal life was almost suspended since the large number of people were busy watching the event since morning. The traffic came to a halt and most people remained inside the house. The eclipse was visible to the extent of 90% which started at 7.38 am.

Bangalore : A remarkable silence gripped the garden city during the solar eclipse. It was partial in this area, and a majority of the people remained confined to their rooms and vehicles were off the roads. From the initial hot climate a pleasant weather prevailed around 8.30 am when a near totality of the eclipse was achieved.

Chennai : Thousands of people gathered near the Birla Planetarium to watch the solar eclipse which was partial in Tamil Nadu. A majority of the people preferred to watch the event on their TV sets. The first contact of the moon with the sun occurred at 7.30 am. A cloudy climate marred exciting moments which lasted for about 44 seconds.

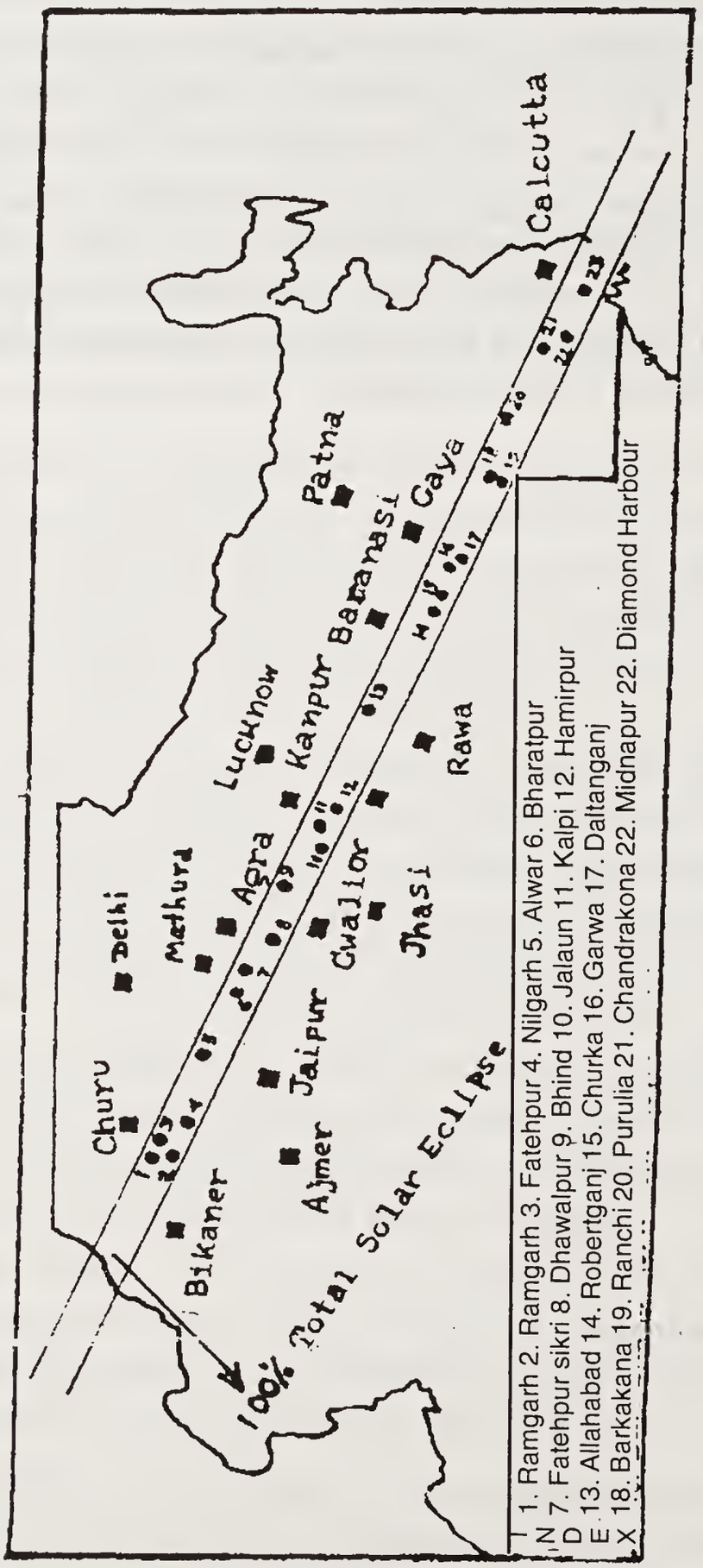
Thiruvananthapuram : Several hundreds of people witnessed the partial solar eclipse in this area. Special arrangements were made by the Observatories and Science Forums for viewing the event in some parts of Kerala.

Pondicherry : The temple authorities cancelled puja and Government offices and educational institutions remained closed. Busy roads were deserted and people remained indoor during the solar eclipse in the morning.

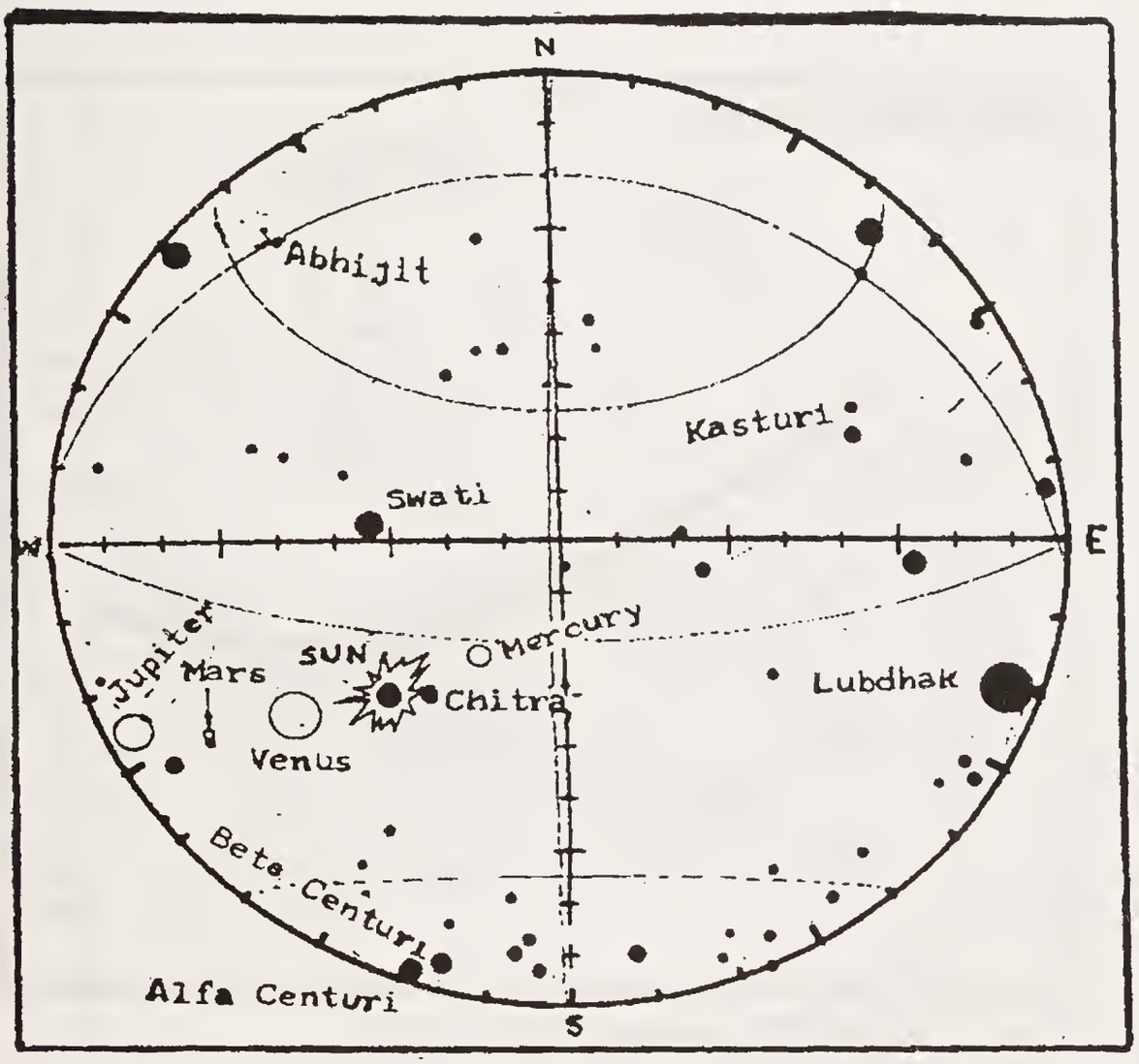
Kurukshetra : More than a million pilgrims from all over the country took bath in the sacred waters of the Brahma sarovar and Sanehit tank amid chanting of hymns and blowing of conch shells and tinkling of temple bells in the morning. Some VIPs also joined the pilgrims on the occasion.

Nim Ka Thana (Sikar), Rajasthan :

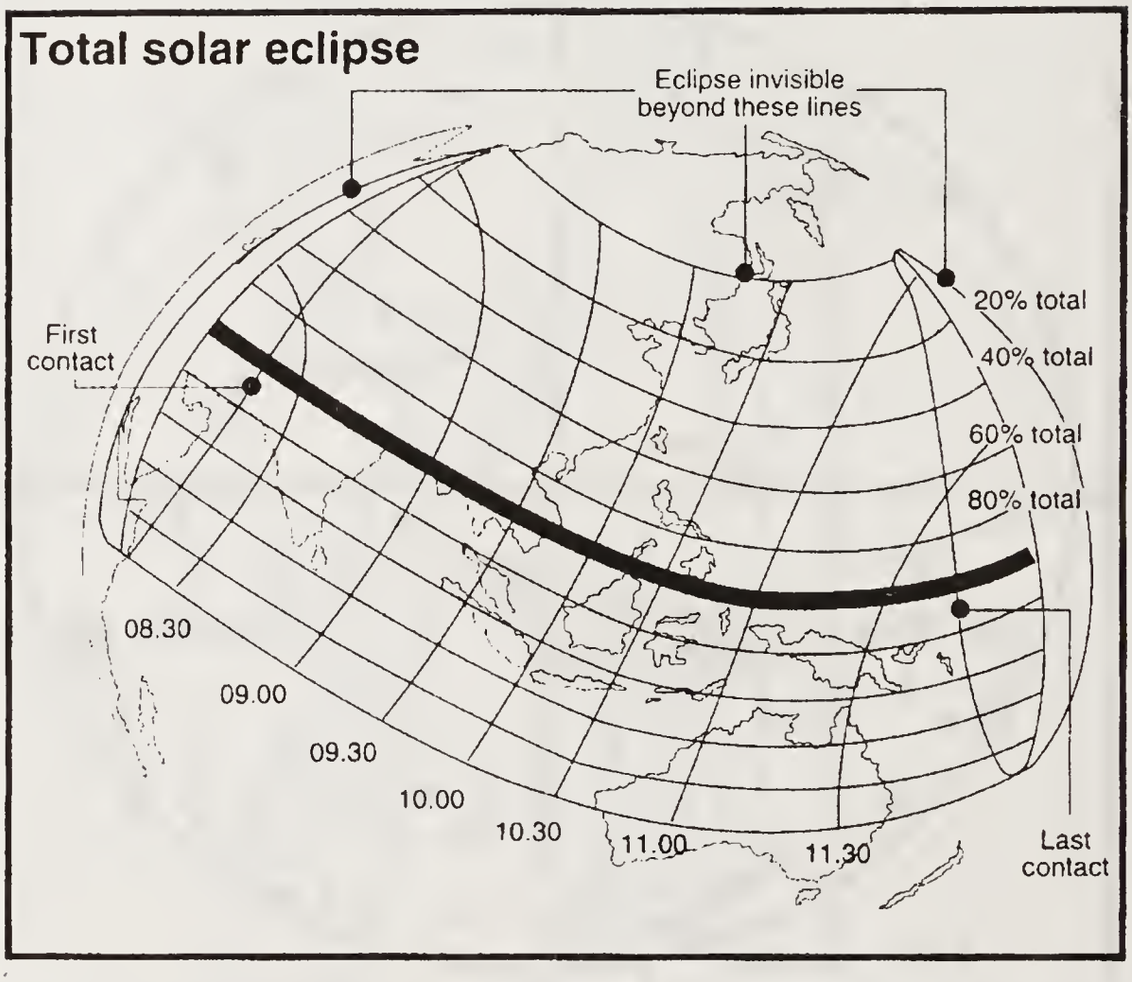
The scientists, technicians and other experts of various fields gathered in this place to watch the solar eclipse. This site was selected by the astronomers because this was a suitable place as the sky was expected to be clear by 90% compared to U.P. (80%), MP (60%) and Bihar (50%). At 7.24 am. the eclipse started and around 8 am. it was half way through when it started getting dark with fall of temperature. At 8.32 am. it was a perfect scene of dawn.



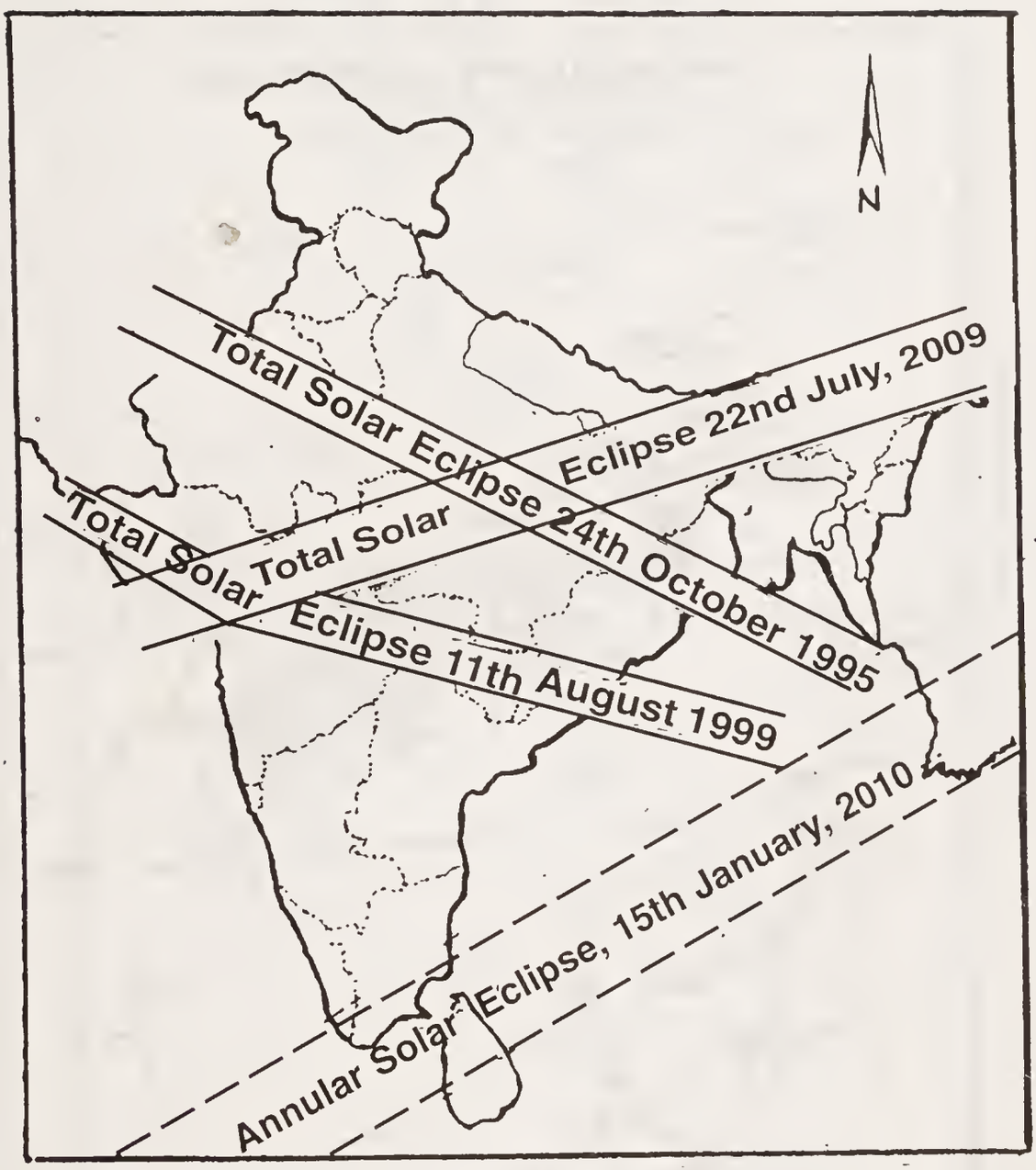
Name of the places from where total solar eclipse have been seen



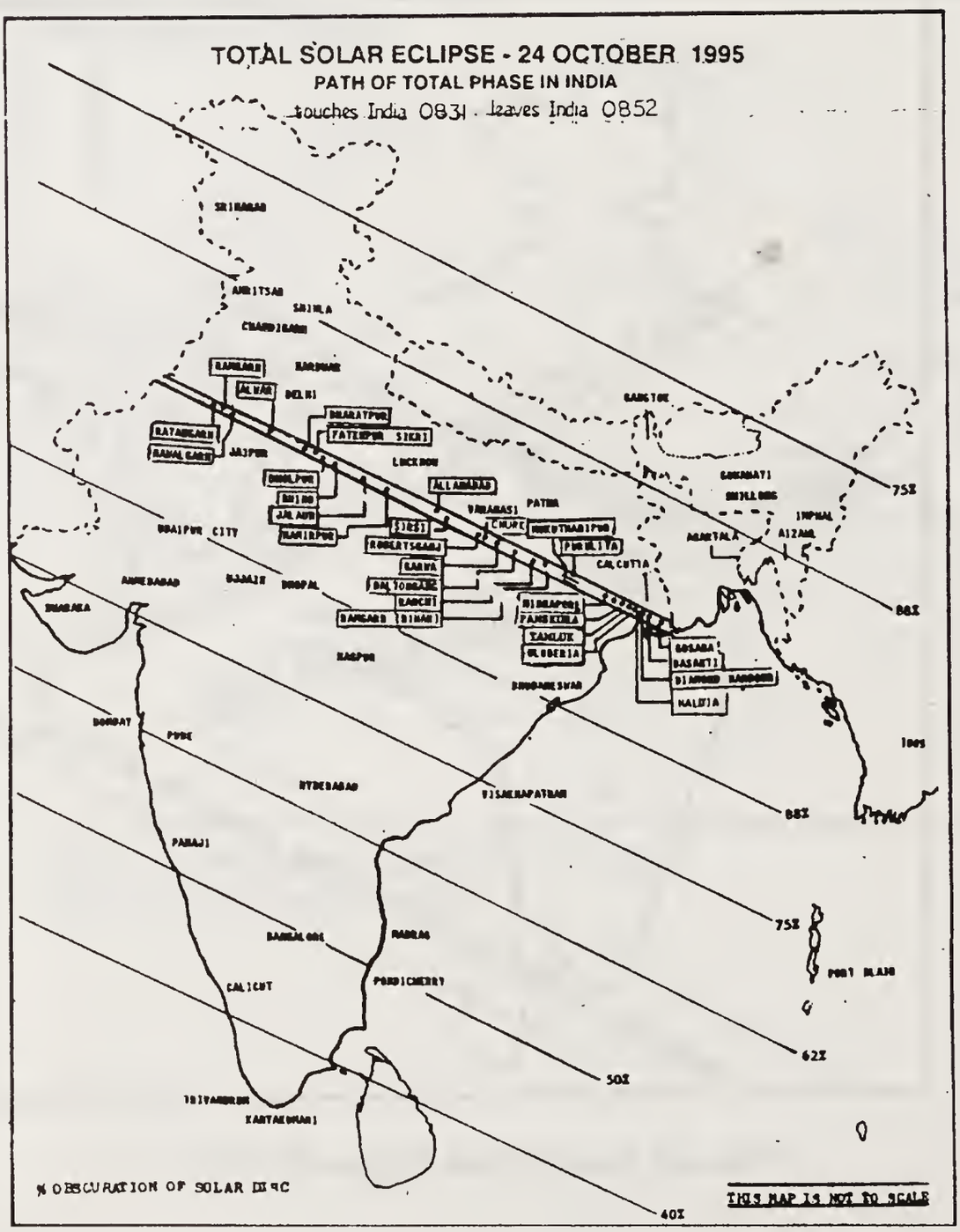
A map of the sky at the time of total solar eclipse at 9 a.m. on 24 October, 1995. Due to total solar eclipse when darkness engulfed the sky in the morning both planets Mercury and Venus were seen in the west and east of the sun respectively together with bright stars like Chitra, Swati.

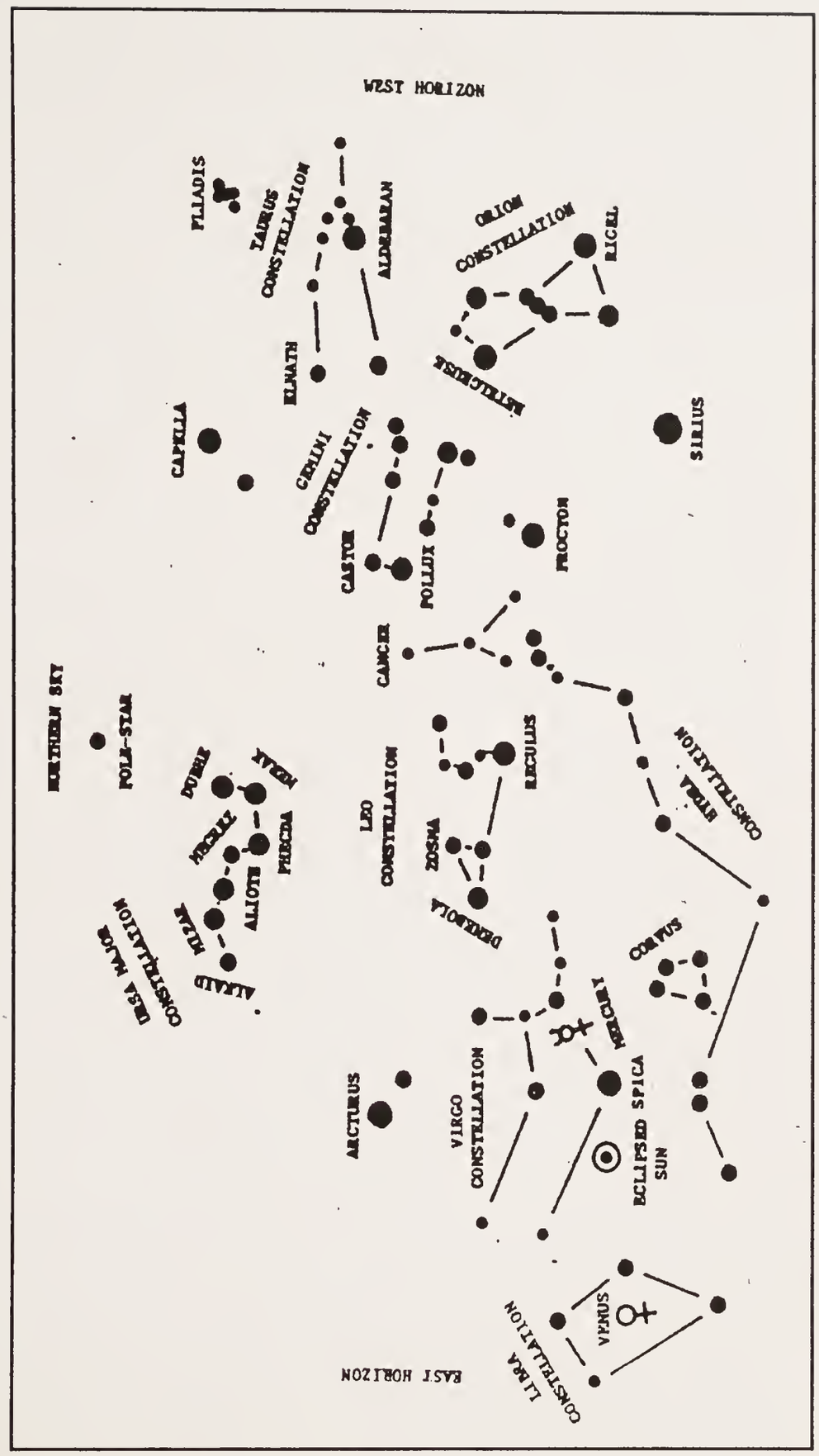


Viewing path of total solar eclipse of Oct. 24, 1995
Times for mid-eclipse shown in IST.



Total and Annular Solar Eclipse till 2010 A. D.


TOTAL SOLAR ECLIPSE - 24 OCTOBER 1995
PATH OF TOTAL PHASE IN INDIA
touches India 0831 leaves India 0852
SRINAGAR
AMRITSAR
SHIMLA
CHANDIGARH
BIKANER
ALWAR
DELHI
BHARATPUR
FATEHPUR SIKRI
RATANGARH
RAWALSAR
JAIPUR
LUCKNOW
ALLAHABAD
PATNA
VARANASI
GANGTOK
GAUHATI
SHILLONG
IMPHAL
AIZAWL
AGARTALA
CALCUTTA
UDAIPUR CITY
AHMEDABAD
BHOPAL
DWARKA
RAIPUR
BHUBANESWAR
BOMBAY
PUNE
HYDERABAD
VISAKHAPATNAM
PARAJI
MADRAS
PONDICHERRY
CALICUT
PORT BLAIR
75%
88%
88%
75%
62%
50%
40%
% OBSCURATION OF SOLAR DISC
THIS MAP IS NOT TO SCALE



star chart during total eclipse